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EPA Superfund
Record of Decision:

NATIONAL SOUTHWIRE ALUMINUM CO.
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HAWESVILLE, KY
02/19/1993

NATIONAL SOUTHWIRE ALUMINUM COMPANY SUPERFUND SITE

RECORD OF DECISION

FEBRUARY 19, 1993

RECORD OF DECISION

THE DECLARATION

SITE NAME AND LOCATION

National Southwire Aluminum Company Site, Hawesville, Hancock County, Kentucky.

STATEMENT AND BASIS OF PURPOSE

This decision document presents the selected Interim Remedial Action for the National Southwire Aluminum Company (NSA) Site, approximately four miles northwest of Hawesville, Hancock County, Kentucky, which was chosen in accordance with CERCLA, as amended, by SARA and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this Site. The Commonwealth of Kentucky concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Interim Action Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This Interim Remedial Action employs the use of extraction wells combined with a pump and treat system in order to prevent further ground water plume migration, to reduce contaminants in the Ohio River Valley alluvial aquifer at the Site, and to reduce the threat of additional contamination of the Ohio River. This action will also initiate ground water restoration while the Remedial Investigation and Feasibility Study (RI/FS) and post RI/FS activities are being completed. Onsite contamination identified in the unconsolidated alluvial aquifer consists of cyanide, metals, and fluoride in two onsite ground water plumes. Leachate identified in the onsite landfills contains the above contaminants as well as volatile and semi-volatile organics, and polychlorinated biphenyls (PCBs). These contaminated waters need to be further investigated as part of the RI/FS, then later remediated during the Final Site Remedy.

The components of the Selected Interim Remedy are as follows:

- Extraction of contaminated alluvial aquifer ground water;
- Treatment of contaminated ground water;
- Discharge of treated ground water to the Ohio River (in accordance with KPDES requirements);
- Proper disposal of all sludge generated via the pump and treat action (in accordance with RCRA requirements).

STATUTORY DETERMINATION

The Interim Remedial Action is protective of human health and the environment in the short term and is intended to provide adequate protection until a final ROD is signed. It complies with Federal and State applicable or relevant and appropriate requirements (ARARs) for this limited-scope action, and is cost-effective. Although this Interim Remedial Action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this Interim Remedial Action does utilize treatment and thus is in furtherance of that statutory mandate. Because this action does not constitute the Final Remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions are planned to address fully the threats posed by conditions at this Site. Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an Interim Action ROD, review of this Site and of this remedy will be ongoing as EPA continues to develop final remedial alternatives for the Site.

RECORD OF DECISION
NATIONAL SOUTHWIRE ALUMINUM COMPANY SITE

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SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
NATIONAL SOUTHWIRE ALUMINUM COMPANY
SITE, HAWESVILLE, KENTUCKY

1.0 INTRODUCTION

The National Southwire Aluminum (NSA) Company Site (the "Site") was proposed for the National Priorities List (NPL) on July 29, 1991, as defined in Section 105 of Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA, P.L. 99-499). The NSA Site was ranked utilizing the Hazard Ranking System (HRS) and scored 50.0 out of a possible 100 points. This HRS score was calculated as part of the Site Investigation conducted by EPA's Region IV Field Investigation Team (FIT) which collected samples at the Site in 1986. This Interim Remedial Action Record of Decision (ROD) has been prepared to summarize the remedial alternative selection process and to present the selected remedial alternative, in accordance with Section 113(k)(2)(B)(v) and Section 117(b) of CERCLA as amended by SARA. The Administrative Record file for the National Southwire Aluminum Company Site forms the basis for the Record of Decision herein.

2.0 SITE BACKGROUND

2.1 Location, and Description

This aluminum manufacturing facility is located on an 1,100-acre tract of land in Hancock County, Kentucky. This Site is situated within the broad alluvial floodplain of the Ohio River of northwestern Kentucky, approximately thirty miles east of Owensboro (Figure 1). Much of the Site lies within the 100-year floodplain of the Ohio River.

The Site has been utilized from 1969 to the present, and is currently an active facility. The operation produces primary aluminum from alumina ore. Site features include a number of manufacturing and service buildings (Figure 2), three (3) former Site waste disposal impoundments, one (1) active wastewater impoundment, three (3) former waste disposal landfills, a potliner accumulation building, and a drainage ditch. In the central-western portion of the Site is the Hancock County Airport. At the southeastern portion of the Site is the Southwire Rod and Cable Mill (a division of Southwire Company of Carrollton, Georgia). Adjacent to the Site (northwest) is the Big Rivers Power Plant.

2.2 Physiography, Topography, and Surface Water Drainage

The NSA Site is located in the broad Ohio River Valley floodplain (Figure 1). The geographic coordinates are 35 56'42"N latitude and 086 47'16"W longitude. This area is within the Central Lowland Physiographic Province and is located adjacent to the northern boundary of the Western Coal Field region of Kentucky. The land surface is characterized by very low relief and lies approximately 40 feet above the normal water level of the Ohio River. The flood plain extends approximately one (1) mile west of the Site. At this location there is an escarpment approximately 100 feet in elevation.

Surface water drainage follows the low topographic relief at the Site. Relatively poor surface water drainage in the northwest and central portion of the Site is strongly influenced by impermeable clay and silt lenses. The one anomalous feature is the man-made drainage ditch that cuts across the Site generally from south to north, then east into the Ohio River.

2.3 Geology

Geologically, there are three stratigraphic zones of interest at the Site (Figure 3). The Site is situated on the Quaternary aged Ohio River Valley alluvial deposits. The alluvium can be divided into two sections: 1) the lower member of approximately 115-foot thickness on average, characterized by coarse-grained sand and gravel with occasional beds or lenses of silt and clay, and 2) the upper member with an average depth of approximately twenty-five (25) feet characterized by fine-grained silts and clays with occasional lenses of gravel and coarse-grained sand. The depth of the top of bedrock at the Site is approximately 267 feet above MSL (Figure 4). Geologic cross sections in Figures 5-7 depict the stratigraphic nature of the alluvial aquifer and the bedrock aquifer.

Below the alluvium are two Paleozoic groups, the Tradewater and Caseyville formations. The Pennsylvanian aged Tradewater Formation consists of numerous members that are generally composed of shale, sandy shale, carbonaceous shale, sandstone, limestone and coal. The thickness of the Pennsylvanian aged strata ranges from about 350 to about 500 feet.

Below the Tradewater is the Caseyville Sandstone, which represents the bedrock unit at the Site. It is divided into three sections. The uppermost Bee Springs Sandstone member is a massive, coarse-bedded, medium-grained sandstone containing quartz pebbles, which laterally grades into shales. The Battery Rock Coal member contains shale, sandy shale, sandstone, and thin beds of limestone, and coal beds. The lower conglomerate member is a massive, cross-bedded, medium grained sandstone veined with quartz, which grades into shale laterally.

2.4 Hydrogeology

Groundwater at and near the Site is available from two aquifer sources: the alluvial aquifer that spans laterally across the Ohio River Plain, and the aquifer found in the Paleozoic rock formation. The alluvial aquifer is by far the most productive. The hydrologic system is interconnected and is recharged primarily by percolation of precipitation, with water exchange both vertically and laterally between the Paleozoic and alluvial aquifers. Ground water flow at the NSA Site has been modeled using MODFLOW [Modular Three Dimensional, Finite Difference Ground Water Flow Model (McDonald and Harbaugh, 1988)]. A thorough description of this modeling effort is described in Technical Memorandum #8 (Treatability Study for Ground Water (Appendix A.4)]. Additional information concerning drilling and monitoring well installation is found in Technical Memorandum #1 (Appendix A.1)]. This technical memorandum summarizes both drilling and monitoring well installation as well as ground water sampling. Well installation (as summarized by Tech. Mem. #1) indicates that wells were installed to delineate the extent of the plume and water samples were taken for total cyanide analysis in NSA's onsite laboratory. The results are generally lower than other analyses conducted by either the U.S. EPA or the Commonwealth of Kentucky, however, the results still indicate that levels of cyanide are orders of magnitude above the MCL in the North Plume, and significantly elevated in the South Plume. Additional information is found in Technical Memorandum #2 which summarizes Ground Water Sampling (Appendix A.2), and in Technical Memorandum #7 which summarizes an Aquifer Pump Test (Appendix A.3).

Groundwater flow, as determined by recent well data and the MODFLOW model in the area is generally toward the Ohio River (Figure 8). Also, water levels from cluster wells indicate there is an upward trend of ground water discharge towards the Ohio River. This information indicates that once contaminants enter the ground water at the disposal pond area, contaminants likely reside and flow within the unconsolidated alluvial aquifer towards the Ohio River where discharge occurs. At the present time, there is no reason to believe that ground waters with cyanide, metals, and fluoride would preferentially flow far downward into the bedrock aquifer. Also, at the base of the unconsolidated alluvial aquifer there is a dense shale layer that was identified in recently installed Well MW-204D (total depth 130 feet). This shale layer, if laterally continuous would further retard flow into the bedrock aquifer.

Information concerning high-flood stage suggests that highwaters will back up and recharge the alluvial aquifer adjacent to the River (Figure 9). Similar conditions were identified during 1989 for typical conditions and in 1990 for flow reversal (Figures 10 and 11). However, the significance of this effect is dependent upon the length and severity of the flooding event. Also, due to the significant accumulation of silts and clays adjacent to the River, it is not likely that the high-stage flooding events would cause reversal of such magnitude that ground water flow would occur at significant distances through the unconsolidated aquifer, then be forced 150 feet downward into the lower bedrock aquifer.

The measured hydraulic gradient is approximately one foot per 1,000 horizontal feet (0.001). The estimated flow velocity for the Site is approximately 2 feet per day (Given an assumed porosity for sand and gravel of 30%). The piezometric surface contour map (Figure 11) also indicates ground waters mound around the wastewater impoundment area. This may cause some radial flow from the wastewater impoundment areas. However, present and past ground water flow information indicates that flow to the southwest, south, or west appears to be minor.

2.4.1 Monitoring Well Installation Summary

In 1979, NSA installed 12 monitoring wells along the perimeter of the North Pond and adjacent to the berm of the impoundment to determine if hazardous substances in the pond were leaching into the ground water. A Hydrologic Assessment of the Disposal Ponds at the Site was performed in 1979 and 1980 by NSA's contractor Environmental Resource Management, Inc (ERM). This study concluded that significant levels of cyanide, fluoride and metals were leaching from the North Pond into the adjacent ground water. During this investigation, an additional 14 wells were installed around both the North and South Ponds.

In May of 1980, 5 wells were installed by NSA (NSA wells 1-5). In October/November of 1985, 12 wells were installed by Fuller, Mossbarger, Scott, and May [(FMSM) wells 102-112). In November/December of 1985 12 in-plant monitoring wells were installed by Kenvirons (wells 1-12). These wells have been used for continuous sampling by NSA since 1986. However, one of these wells was not utilized and is not included in the well count (well #10). During the LSI 10 additional wells were installed (wells MW1-10). Recently, NSA has installed 15 additional ground water monitoring wells at the Site in an attempt to obtain additional data regarding groundwater contamination (wells 201-214).

The total number of wells installed at the NSA Site since 1978 is 79. A summary of wells installed at the NSA Site is included in Appendix A.6.

2.5 Affected Population

The NSA facility is located in a sparsely populated area approximately four miles northwest of Hawesville, Kentucky. Human population near the Site is estimated as follows: within a .25-mile radius, 274; within the zone .25 to .50 mile from the Site, 603; within .5 to 1 mile, 432; within 1 to 2 miles, 4,146; 2 to 3 miles, 2,568; and 3 to 4 miles, 3,788. The majority of the population within these ranges is located across the Ohio River in the State of Indiana.

2.6 Ecological Information

A complete ecological assessment will be performed as part of the RI/FS. There has not been a characterization of the domestic, livestock or wildlife animal population near the Site, but the Ohio River floodplain is generally populated by muskrats, beavers, various small vertebrates and invertebrates, songbirds and waterfowl. The River itself provides habitat for a number of fish and other vertebrates and invertebrates. The bullhead mussel, a species of concern, has been found in the Ohio River less than one mile from the Site.

2.7 Water Usage

Releases have contaminated the unconsolidated alluvial aquifer at the Site, which is used for industrial processes and was previously used for drinking water for about 1,000 plant employees. NSA found one of the three (3) on-site water supply wells to be contaminated with metals and cyanide at levels just below the Maximum Contaminant Levels (MCLs), and that well is no longer utilized as a source of potable water. The three wells are currently being used only for industrial purposes and pump approximately 790,000 gallons per day (550 gallons per minute). Municipal water is now utilized for all potable water at the NSA Site. The closest residential well is approximately 1/2 mile southsoutheast of the Site. According to the resident, the private well has a total depth of approximately 65 feet. Within a four-mile radius of the Site, six municipal water companies and several private wells obtain water from the alluvial aquifer, and more than 16,000 people obtain water from these sources. Most of these water consumers live across the Ohio River from the Site. According to the Kentucky Division of Waste Management Site Investigation Report (1986), there are approximately 1,523 persons utilizing the ground water for drinking purposes within three miles of the Site. These people are not served by the municipal water supply. Within the four-mile radius the alluvial aquifer is also used for industrial processes, cattle watering, and commercial food processing. Contaminants in concentrations above MCLs have been detected in one of three onsite water supply wells. Contaminants have been detected above MCLs in many of the onsite monitoring wells.

2.8 Adjacent Land Usage

Prior to 1990, fields at the northern portion of the Site were planted annually in soybeans and possibly corn. NSA recently informed EPA that agricultural use of these fields ended in 1989. Some of the adjacent residences to the west of the Site utilize small portions of their property for limited agricultural purposes. A assessment of current land usage adjacent to the Site will be conducted in the RI/FS.

2.9 Climatology

The climate in this area of Kentucky is described as being temperate with warm, humid summers and moderately cold winters. The normal annual total precipitation for the area is approximately 44 inches, and the net annual precipitation is approximately 8 inches. The highest mean monthly precipitation is in the spring, and the lowest is in the autumn. The annual prevailing wind direction at the facility is almost evenly distributed between north to northeast and east to southeast. Percentages of wind direction are broken down as follows: north and northeast 27.8, east and southeast 26.7, south and southwest 18.4, and west to northwest 18.8. The remaining 8.3 percent of the year is calm, and the annual average wind velocity is 10 miles per hour.

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

3.1 Operational History

The facility produces elemental aluminum from aluminum ore. The ore is delivered to the site by barge (via the Ohio River) and transferred to the production areas by a conveyer system. Elemental aluminum is produced by placing the alumina ore (A1[2]O[3]) in carbon-lined metal vessels called pots. Also contained in the ore are trace elemental impurities including but not limited to copper (Cu) and nickel (Ni). In order to facilitate the process, a sodium fluoride bath (Na[3]AlF[6]) is added to the pots. High amperage, low voltage, direct current (DC) is run through the pots, reducing the aluminum in the ore to its elemental state. Elemental impurities likely contained in the ore and/or bath include but are not limited to: copper (Cu), iron (Fe), manganese (Mn), magnesium (Mg), nickel (Ni), zinc (Zn), beryllium (Be), titanium (Ti), vanadium

(V), sodium (Na), gallium (Ga), and cadmium (Cd). Molten aluminum collects in the bottom of the pots where it is siphoned off. The molten aluminum is then transported in crucibles to adjoining buildings, where it is cast into ingots. Molten aluminum is also supplied to Southwire Rod and Cable, adjacent to the south of the plant.

Cyanide (CN) is produced and incorporated into the potliner where the carbon-lined pots react with atmospheric nitrogen during this process. Appreciable amounts of total cyanide reside in the potliners at levels up to 2,500 ppm. The facility has 448 active carbon-lined pots. The aluminum-reducing pots are operated continuously until the carbonliner begins to burn through. This takes approximately 5-10 years to occur. Once a pot begins to experience burn-through, it is taken out of service and replaced with a reconditioned pot. The decommissioned pot is prepared for use again by removing and replacing the carbon liner (potliner).

3.1.1. Potliner Removal and Disposal

In 1971, NSA began potliner removal by removing the spent potliners from the pots in the pot rooms. In 1973 a concrete pad (the Dump Pad) was constructed for potliner removal. At this location potliners were removed from the pots utilizing water to soak the spent potliner to assist in the removal. Spent waters accumulated in an earthen sump where the Region believes much of the water leached into the subsurface. NSA disposed of spent potliners onsite until July 25, 1986, after which NSA disposed of them offsite at a hazardous waste disposal facility. According to NSA, approximately 26,000 cubic yards of spent potliners were disposed in the North Pond (now referred to as part of the Potliner Disposal Area). At present, NSA generates approximately 250 tons of spent potliner each month (3,000 tons/year).

Activities continued at the Dump Pad until 1990 when a building was constructed over the location. This building is referred to as the Spent Potliner Accumulation Building which is utilized for removing the potliners from the spots and transferring the wastes to trucks for transport and disposal offsite. Water is no longer utilized in the spent potliner removal process. The previous location of the spent potliner removal water sump is now filled in with sand and covered with concrete. Dust generated from the spent potliner removal procedure is captured and contained in drums prior to removal to a hazardous waste disposal facility.

3.1.2. Disposal Pond Areas

Two clay-lined ponds (North and Old South Ponds), one unlined pond(East Pond), and one pond lined with a 60-mil synthetic liner (New South Pond), each covering approximately six acres, were constructed for disposal of industrial wastes from the facility. Wastes disposed in the North Pond included spent potliners containing cyanide from the aluminum reduction process and calcium fluoride slurry from the air quality control system. Calcium fluoride slurry was disposed in the Old South Pond, East Pond and New South Pond. NSA closed the North Pond in 1986 and covered it with a synthetic cap and a 1.5 foot layer of clay and soil. The area is currently densely vegetated. The Old South Pond has been filled to capacity, and its use ceased in 1989. The East Pond has also been closed. The New South Pond is now used for disposal of the calcium fluoride slurry and electrostatic precipitater (EP) catch, as approved by the Commonwealth of Kentucky Division of Waste Management. Approximately 15-30 tons of EP dust are generated per day. EP dust primarily consists of aluminum oxide, aluminum fluoride, sodium fluoride, and sodium aluminum fluoride, with minor amounts of iron (Fe), silicon (Si), vanadium (V), calcium (Ca), manganese (Mn), nickel (Ni), potassium (K), zinc (Zn), chromium (Cr), and gallium (Ga). It is probable that EP dusts also contain traces of cadmium (Cd), berillium (Be), lead (Pb), and magnesium (Mg).

3.1.3 Site Landfilled Areas

Three onsite areas have been utilized for disposal of hazardous materials. These are referred to a two industrial waste landfills and the Taylors Wash Landfill (Figure 2). According to NSA, solid and hazardous waste disposal activities in the landfilled areas was not well documented. In the case of disposal activities at the Taylors Wash Landfill, NSA has informed EPA that no records exist. This area was formerly a ravine and was filled in with various Site generated wastes including an unknown amount of spent potliner material. In 1981, a clay barrier was installed at a narrow point in the ravine near the Ohio River to prevent seepage of water from the filled area to the bank of the river. Barrier construction consisted of a minimum 4-foot wide compacted clay core keyed approximately 2 feet into the original grade. A drainage tile was constructed along the length of the barrier just inside the barrier core on the landfill side to collect leachate. The drainage system is accessed by a standpipe. It is estimated that approximately 30,000 cubic yards of industrial wastes were disposed in Taylors Wash Landfill prior to 1981

The other two industrial waste landfills were built in November of 1981 by excavating approximately 10 to 15 feet below grade over an area of approximately 200 feet by 500 feet. It is estimated that approximately 40,000 cubic yards of industrial wastes were disposed into the larger landfill, while approximately 10,000 cubic yards of industrial wastes were disposed of in the smaller landfill. According to NSA, no spent potliners were disposed into the two industrial landfills.

3.1.4 Refractory Brick Disposal Area

In addition to the industrial waste landfills there is a separate disposal area for refractory brick waste from the carbon flues and other sources. The Refractory Brick Disposal Area is located west of State route 334 at the north end of the main brick plant property. It is presently estimated to cover an area of approximately 2 acres. No information exists on disposal activities in this area; therefore, during the RI/FS the Refractory Brick Disposal Area will be characterized.

3.1.5 Effluent/Drainage Ditch

The effluent/drainage ditch that runs through the central portion of the Site drains the majority of the south, central, and northern part of the Site. The drainage ditch discharges from the Site into the Ohio River within 1/4 mile of the Site. This ditch also has drained excess runoff from around the disposal ponds. Contaminants that include but are not limited to fluoride and metals were identified during previous investigations EPA and Kentucky at this location. In 1991, NSA removed approximately 2,000 cubic yards of contaminated sediment from 4,800 feet of drainage ditch. The excavated material was disposed in the south slurry pond. Resampling of the drainage ditch was performed by NSA in 1992. Preliminary results of this sampling effort indicate that contaminant levels have been reduced in the drainage ditch. This information will be reevaluated during the RI/FS and during the preparation of the Final Site Remedy Strategy to insure that all drainage ditch remedial efforts have reduced the levels of contaminants to acceptable levels.

3.1.6 PCB Handling Areas

It presently appears that repeated spills of heat transfer fluids or other polychlorinated biphenyls (PCBs) containing fluids caused several areas of PCB contamination in onsite soils (see section 6.5). These areas include, but may not be limited to: 1) the area surrounding the new cooling tower footing, 2) the vicinity of the pitch heater building, 3) the pitch storage tanks, 4) in the vicinity of the fire station, 5) the new press building, 6) the PCB stockpile area utilized during the 1992 PCB contaminated soil removal activity, and 7) adjacent and north of the Spent Potliner Accumulation Building. The contamination was discovered in 1991 during

excavation of a small cooling tower foundation. Dames & Moore investigated the contamination for NSA by collecting and analyzing surface and subsurface soil samples. Soil excavated for the cooling tower foundation was stockpiled (in part) over the two (2) Industrial Landfills prior to offsite disposal. Eight-hundred fifty (850) cubic yards of PCB contaminated soils were transported by Chemical Waste Management, Inc. for disposal at the Emelle, Alabama hazardous waste facility in February 1992.

3.2 Enforcement Summary

In September 1992, NSA signed an Administrative Order on Consent (AOC) to perform an RI/FS. NSA through their contractors will perform the studies while EPA and the Commonwealth of Kentucky will oversee all RI/FS and related Site study activities to be performed to ensure compliance with all applicable laws and regulations and to ensure the work proceeds in a timely manner. The Baseline Risk Assessment which is also part of the study will be initiated by EPA once the analytical data from the RI sampling has been quality assured/quality controlled (QA/QC) and submitted by NSA's RI contractor.

Previous enforcement activities were initiated in 1985. A Preliminary Assessment (PA) was completed on February 25, 1986 by the Kentucky Division of Waste Management, under the CERCLA EPA PA/SI Cooperative Agreement with EPA. This assessment indicated that the NSA Site had significant contamination, further studies were warranted, and the Site was a good candidate for the NPL. As a result, a high priority Site investigation was conducted. A Site visit was made at NSA on May 8, 1986, and an investigation was performed on May 12, 1986 by the Commonwealth of Kentucky Division of Waste Management.

On July 26, 1989, a Notice of Violation (NOV) was issued to NSA by the Division of Water with respect to contaminated sediment that existed in the onsite drainage ditch which drained active industrial areas of the Site. The inspection report indicated that EP dust from the air pollution control system (APC) had entered the ditch, and it called for removal of the dust and any blackened sediment. In response to the NOV, NSA removed sediment from approximately 4,800 feet of the drainage ditch. Approximately 2,000 cubic yards of material was excavated from the drainage ditch and disposed in the New South Pond.

Other NOVs were issued in November of 1990 and February 1992 respectively. The 1990 NOV was issued due to excessive total recoverable zinc and copper concentrations in discharge from storm water outfall 006. As a result, NSA modified the EP hopper and excavated approximately 4,200 square yards of rock and soil from the area of the scrubbers to the New South Pond. The area was then covered with asphalt to further reduce the potential for EP dust to enter storm water ditches. These construction activities were completed on August 22, 1991. Activities initiated to comply with the February 1992 NOV included a compliance and proposed sampling schedule. Any proposed activities concerning this NOV have not been finalized.

In the late 1980's, the Commonwealth of Kentucky referred the Site to EPA for ranking under the HRS. In 1990 and 1991, surface soil, subsurface soil, sediment, surface water, monitoring well, industrial well, and some private well samples were collected during the EPA Preliminary Field Investigation as reported in the Interim Final Listing Site Inspection Report (LSI) by NUS Corporation (April 1991). The HRS Score generated for the NSA Site was 50.0. Conclusions from the LSI indicated that onsite ground water, soils, and drainage ditch sediments contain significant levels of cyanide, fluoride, and metals. NSA has stated to EPA that it has cleaned out a drainage/effluent ditch that was found to contain significant concentrations of fluoride and metals. In anticipation of the Site being listed as final on the NPL, NSA (through its consultants) has also collected additional data regarding the environmental condition of the property.

The NSA Site was proposed for inclusion on the National Priorities List (NPL), as defined in Section 105 of CERCLA, as amended by SARA (P.L. 99499), in July 29, 1991. At present, this Site has not been listed as final on the NPL.

3.2.1 RCRA Summary

NSA generates spent pot liners from their primary aluminum reduction process. NSA also generates paint filters from spray paint booths. These wastes have been disposed in the Potliner Disposal Area (North Pond). Spent potliners (K088) and paint filters (F017) were listed as hazardous wastes, in Interim Final Regulation, in the Federal Register dated July 16, 1980. In anticipation of final listing of these wastes, NSA filed a RCRA Part A application in November 1980, and gained interim status. K088 and F017 were temporarily suspended as listed hazardous wastes in the Federal Register dated January 16, 1981. Subsequently, NSA requested withdrawal of their Part A application and received approval in July 1982, from Kentucky and EPA. Interim status was not taken from the facility, however, RCRA regulations have not been applied to NSA. The K088 waste at the time of disposal was not listed or regulated under RCRA.

Currently, NSA holds the following permits: KPDES #KY0001821 for the discharge of storm water, noncontact cooling water, and sanitary waste water into the Ohio River, Air (Operating) #0-82-25 for air emissions, and also a Certificate of Registration for Hazardous Waste Activity under EPA KYD049062375.

3.2.2. TSCA Summary

In 1991 during the excavation of a cooling tower foundation near the eastern portion of the Site PCBs were encountered at approximately 12 feet below land surface. NSA coordinated an investigative effort on this contamination with the U.S. EPA Toxic Substances Control Act section (TSCA). Sampling and analysis was conducted in order to characterize contaminant levels within the cooling tower foundation. Sheet pilings at the excavation were grouted to prevent further PCB oils to enter the excavation. Forty two (42) composite samples were subsequent taken of the PCB contaminated soils temporarily stored at an onsite staging area. NSA removed approximately 850 cubic yards of PCBcontaminated soils at the excavation for a cooling tower footing. One hundred thirty (130) truck loads of PCB contaminated soils were transported and disposed at the Chemical Waste Management facility in Emelle, Alabama. During this sampling event, PCB levels were detected in these soils from below 1 ppm to approximately 8,940 ppm.

This initial remedial effort was funded by NSA and coordinated with TSCA Program. With the Site expected to be listed as final on the NPL, the Superfund Program began to review the TSCA PCB data for this Site in April, 1992. Present plans under CERCLA include final assessment and cleanup of PCB contaminated areas as a coordinated effort through the Superfund Remedial Program.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for Interim Remedial Action at the NSA Site was presented at the Public Meeting held on January 19, 1993 at the Hancock County Middle School. This document was made available to the public in the information repository maintained at the EPA Docket Room in Region IV, and at the Hawesville Library. Notice of the availability of this document and notice of the Public Meeting was published in the Hancock Clarion on January 7, 1993, and in the Perry County News on January 11, 1993. The Public Comment Period was held from January 7, 1993 through February 7, 1993.

At the Public Meeting, representatives from EPA answered questions concerning the proposed Interim Remedial Action to pump and treat the two onsite ground water plumes. Other questions

asked included: the types of contaminants onsite, could these contaminants get offsite, will the Hawesville Municipal Wells need to be sampled, what areas of the Site have been investigated, and is it safe to raise livestock and produce on nearby agricultural lands?

5.0 SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

The Interim Remedial Action involves the implementation of a multiple-well gathering and pump and treat system to control and contain the two onsite ground water plumes, to initiate ground water restoration activities prior to final Site remediation, and to obtain information on the aquifers response to pumping. Previous investigative efforts suggest contamination resides in the North and South Plumes are located onsite within the unconsolidated (upper) aquifer. The exact number of withdrawal wells will be evaluated and determined during the Remedial Design. This aquifer is classified in the Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy, Final Draft, December 1986, as a Class IIA aquifer that is a current source of drinking water. Although this interim remedy does not constitute a final remedy for the site, these activities will: 1) reduce the levels of contaminants within the unconsolidated alluvial aquifer, 2) prevent further migration of contaminants (presently in the plumes) toward the Ohio River, and 3) prevent any potential migration of contaminants into several stratigraphically lower Class IIB aquifers that are classified as "a potential source of drinking water". Previously acquired information is supportive of these "interim" measures while a more thorough site investigation is conducted. Following the approval of this Interim Action ROD, the RD/RA for the "interim" remedy is expected to commence. The RD/RA for "interim" measures is expected to be completed in a much shorter time frame since much of the engineering, design, specifications, and treatability studies have been completed as part of an expedited site remediation approach. A standard RD/RA will take approximately 14 to 18 months to complete, however, the RD/RA for "interim" measures is expected to take less than 6 months.

On September 30, 1992, NSA entered into an Administrative Order on Consent (AOC) with EPA to perform a Remedial Investigation Feasibility Study (RI/FS). This investigation was formally initiated at the Public Meeting on January 19, 1993. Upon completion of the RI/FS, the groundwater pump and treat system as discussed in this Interim Remedial Action, may be incorporated into the Site Remedial Design specified in the Final Action ROD. The Final Action ROD will outline all other additional remedial activities that will be required to clean up the Site.

A typical RI/FS takes approximately 18 to 24 months to complete. However, previous onsite investigative work including 64 previously installed wells and 15 wells recently installed by NSA's contractor Dames & Moore, should significantly reduce the time for this final investigation. Once the RI/FS is completed, work will begin on the Remedial Design/Remedial Action for the Final Action. Again, since much of the "interim" measure work will likely aid in the Final Action, the RD/RA for the Final Remedy will likely take between 8 and 12 months to complete. It is expected that this will also be completed in an expedited manner.

6.0 SUMMARY OF SITE CHARACTERIZATIONS

6.1 Nature and Extent of Contamination

Contaminants have been released at the Site as a result of the facility's operation and onsite disposal of wastes. The primary contaminants identified in onsite soils, ground waters, surface waters, drainage ditch sediments, and leachate streams include but are not limited to CN (refers to "total", and "amenable" which is often utilized as a measure of "free cyanide", see discussion in Section 6.1.1. below), F, PCBs, As, Pb, Ni, Be, Cd, Co, Cr, Zn, V, and Mn. Also, several volatile or semivolatile compounds were identified in the leachate at the Taylors Wash Landfill. The contaminants identified above both background, MCLs, and/or Preliminary

Remediation Goals (PRGs) are: 1,2-Dichloroethane and 2,4-Dimethylphenol. A ground water sample from MW-09 to the South of the onsite production areas revealed 1,1,1Trichloroethane (TCA), however, the level of TCA was below the MCL. Additional information will need to be obtained on the area near MW-9 during the RI/FS since thisarea has not been previously characterized. PCBs have also been detected at the Site. It is likely that spillage of PCB containing heat transfer fluids is responsible for the PCB contamination in the soils in the vicinity of the cooling tower. Very little information exists concerning potential PCB contamination in the ground water. Additional ground water information will be obtained during the RI/FS at locations where PCB contamination has been identified in the soil.

6.1.1 Cyanide Evaluation

Concerning ground water, an MCL of 0.2 ppm which applies to "free cyanide" (40 CFR Parts 141 and 142; National Primary Drinking Water Regulations; Vol 57, No. 138, July 1992). This guidance further states, "EPA is specifying the use of the "cyanide amenable to chlorination" test for determining the "free cyanide" concentrations, while the "total cyanide" analytical technique is being allowed to screen samples".

Previous analytical results at the NSA Site for cyanide (total, and amenable - as a measure of "free cyanide") have all indicated that cyanide levels in the ground water plumes are orders of magnitude above the MCL. The previous analytical results for "total cyanide" have been very consistent while the previous analytical results for "amenable cyanide" as a measure of the "free cyanide" have been variable (even though results were variable, all analyses for the main portion of the North Plume were consistently orders of magnitude above the MCL while the levels for the South Plume were noted to be significantly elevated). In response to the previous variable results for "amenable cyanide" at the NSA Site, it will be necessary during the Remedial Design for the Interim Remedial Action to utilize different or enhanced analytical techniques to consistently identify the amount of "free cyanide". If consistent procedures or analytical techniques cannot be successfully determined as part of the Remedial Design, then the cleanup level (0.2 ppm) for effluent or waters discharged to the Ohio River should be applied to "total cyanide". This cleanup level would be justified since the "free cyanide" would be a variable portion of the "total cyanide".

Within this Interim Action ROD, the term "amenable cyanide" is used since much of the previous analytical data utilized this terminology, and it should be noted that this was utilized in order to determine the "free cyanide".

6.2 Disposal Ponds/Wastewater Impoundments

NSA has utilized four (4) disposal ponds (wastewater impoundments) since plant operations commenced in 1969. These ponds are designated as the North Pond, South Pond, East Pond, and New South Pond. In 1980, ERM determined that leaching was occurring beneath the North Pond (Table 1). The 1980 ERM Investigation determined significant levels of cyanide and fluoride were present in the ground waters in the area of the disposal ponds. In 1986, the Kentucky Division of Waste Management investigated conditions in this area, and recovered samples and data for cyanide and metals. A surface water sample in the North Pond (prior to covering) indicated total cyanide levels up to 165 ppm (as also reported in the

Hydrogeological Investigation Report, ERM, 1980), and amenable cyanide up to 101 ppm. Highest levels of metals reported from the KDWM report are as follows: arsenic (532 ppb), barium (76 ppb), chromium (19 ppb) and mercury (0.3 ppb). Significant concentrations of contaminants in the North Pond area have provided a significant sources has of cyanide, metals, and fluoride to the onsite ground water from the impoundment area to the Ohio River (approximately 1/2 mile east).

6.3 Ground Water Contamination and Onsite Impoundments

The two (2) cyanide groundwater plumes that have been identified thus far are located in the vicinity of the disposal ponds, also referred to as the wastewater impoundment area (North Plume) and under and near the present location of the Spent Potliner Accumulation Building (South Plume). Ground water sampling data in the 1991 Listing Site Inspection Report are presented in Appendix A.5. Recent confirmatory sampling (Tables 2A-2C) conducted in 1992 indicates that significant concentrations of cyanide and metals continue to reside in the two onsite ground water plumes. This confirmatory sampling also included samples of leachate from the Taylors Wash Landfill. Levels of 1,1,1-Trichloroethane, 2,4-Dimethylphenol, and PCBs in the leachate were elevated above background. The Taylors Wash Landfill is located north of the main Site complex approximately 1/4 mile. Contaminated ground waters from this landfill fall within the boundaries of the North Plume (See Section 6.1.6)

6.3.1. North Ground Water Plume

Within the North Plume, cyanide concentrations have been identified up to 56 ppm [(Figure 12) Interim Final Listing Site Inspection Report, NUS, 1991]. Recently, concentrations of total cyanide have been reported up to 30 ppm. Sampling results from well 103 in December 1992 reported amenable cyanide concentrations at 24 ppm, or 120 times the MCL [The MCL is 0.2 ppm for (i.e. - "free cyanide" or cyanide amenable to chlorination), revised Federal Register, July 17, 1992, see section 6.1.1. and 9.2 for details] (Figures 1214). Highest levels of metals reported during the 1991 EPA LSI are as follows: barium (580 ppb), cobalt (260 ppb), copper (51 ppb), lead (73 ppb), magnesium, (69,000 ppb), manganese (8,400 ppb), and nickel (170 ppb). The highest amount of fluoride detected during the 1991 EPA LSI was 220 ppb. Fluoride levels up to 1,770 ppm were detected in one of the monitoring wells near North Pond in 1980. The plume is elongated in the predominant ground water flow direction toward the Ohio River which is approximately 1/2 mile away (Figure 15).

6.3.2 South Ground Water Plume

The South Plume is located beneath and around the Spent Potliner Accumulation Building (previously known as the Dump Pad). The South Plume is more diffuse in shape than the North Plume, possibly because of variable ground water flow directions during high river stage flow reversals. This also may be due to the influence of pumping from the Site production wells to the southwest. Cyanide has been identified in the South Plume at concentrations up to 4.4 ppm for total cyanide (Kenvirons Ground Water Monitoring, well #12, 10/24/91, p. 7) and more recently at 1.21 ppm for total cyanide, and 0.54 ppm for amenable cyanide. The highest levels of metals identified in the south plume are: barium (180 ppb), chromium (21 ppb), cobalt (82 ppb), copper (63 ppb), lead (41 ppb), magnesium (130,000 ppb), manganese (2,400 ppb), and nickel (95 ppb). The highest level of fluoride identified within the south plume was 740 ppb.

6.4 Effluent/Drainage Ditch

The drainage ditch sediments at the Site contain cyanide at levels ranging up to 7.7 ppm, nickel up to 1,400 ppm, arsenic up to 160 ppm, and lead up to 170 ppm. Fluoride has been detected at levels ranging from trace to up to 61,000 ppm in drainage ditch sediments. Samples of the surface soils at the Site have exhibited contamination ranging from trace levels up to 64,000 ppm for fluoride, 20 ppm for arsenic, 12 ppm for lead, and 20 ppm for nickel. Subsurface soil samples at the Site indicate fluoride at levels ranging from trace levels up to 88 ppm, 4.4 ppm for arsenic, 20 ppm for nickel, and 5.3 ppm for lead.

6.5 Cooling Tower Excavation

During recent construction activities, NSA discovered and removed soils contaminated with PCBs at concentrations ranging from below 1 ppm to approximately 8,940 ppm in an excavation for a cooling tower footing. It presently appears that repeated spills of heat transfer fluids or other PCB containing fluids caused several areas of PCB contamination in onsite soils. These areas include, but may not be limited to: 1) the area surrounding the new cooling tower footing (Figures 16 & 17), 2) the vicinity of the pitch heater building, 3) the pitch storage tanks, 4) in the vicinity of the fire station, 5) the new press building, 6) the PCB stockpile area (Figure 18) utilized during the 1992 PCB contaminated soil removal activity, and 7) adjacent and north of the Spent Potliner Accumulation Building. The contamination was discovered in 1991 during excavation of a small cooling tower foundation Dames & Moore investigated the contamination for NSA by collecting and analyzing surface and subsurface soil samples. Soil excavated for the cooling tower foundation was stockpiled (in part) over the two (2) Industrial Landfills prior to offsite disposal. Eight-hundred and fifty (850) cubic yards of PCB contaminated soils were transported by Chemical Waste Management, Inc. to the Emelle, Alabama hazardous Waste Facility for disposal. The extent of PCB contamination at the Site will be further evaluated during the RI/FS. No further remediation of this area will take place during the Interim Remedial Action.

6.6 Onsite Soils Contamination

Samples of surface soils at the Site have exhibited fluoride contamination up to 64,000 ppm, arsenic up to 20 ppm, lead up to 12 ppm, and nickel up to 20 ppm. Subsurface soil samples have exhibited fluoride contamination up to 88 ppm, arsenic up to 4.4 ppm, nickel up to 20 ppm, and lead up to 5.3 ppm. The extent of surface and subsurface contamination will be investigated during the RI/FS. No remediation of these areas will occur during this Interim Remedial Action.

6.7 Onsite Landfill Contamination

6.7.1 Taylors Wash Landfill

The Taylors Wash Landfill occupies what used to be a ravine adjacent to the Ohio River. No records exist for this landfilled area, however, sampling and analyses conducted by Dames & Moore in 1992 indicate that a variety of industrial wastes were disposed of within the ravine. It is estimated that approximately 30,000 cubic yards of industrial wastes were disposed in Taylors Wash Landfill prior to 1981. NSA has indicated that unknown quantities of potliner have also been disposed of in the Taylors Wash Landfill, but they believe that the quantity is small. Preliminary results of sampling at MW-210I at this location revealed the following contaminants: total cyanide (62,900 ppb), amenable cyanide (663 ppb), barium (3,750 ppb), lead (89 ppb), manganese (48,600 ppb), and nickel (320 ppb). Leachate from the standpipe (MW-1000) within Taylors Wash Landfill revealed the following contaminants: manganese (280 ppb), 2,4-Dimethylphenol (1,100 ppb), 1,2-Dichloroethane (17 ppb), and PCBs: Arochlor-1242 (7.3 ppb).

6.7.2 Industrial Landfills

The other two (2) Industrial Waste Landfills were built in November of 1981 by excavating approximately 10 to 15 feet below grade over an area of approximately 200 feet by 500 feet. It is estimated that approximately 40,000 cubic yards of industrial wastes were disposed of into the larger landfill, while approximately 10,000 cubic yards of industrial wastes were disposed of in the smaller landfill. According to NSA, no spent potliners were disposed into the two Industrial Landfills. A sample was obtained from MW-214 downgradient of the industrial landfills. Preliminary analyses identified the following contaminants: chromium (144 ppb), lead (220 ppb), manganese (21,300 ppb), and nickel (652 ppb).

6.8 Onsite Production Wells

In 1985, NSA detected cyanide in one of its three on-site water wells. This well provided drinking water to plant employees. Results from the analyses indicated that NSA Production Well #1 contained a total of 0.133 ppm of cyanide. This significantly elevated level is still below the Maximum Contaminant Level (MCL) of 0.2 ppm as established by regulation pursuant to the Safe Drinking Water Act. Cyanide that is amenable to chlorination was detected at 0.020 ppm. Barium, chromium, and mercury, were also detected. Production Well #2 contained 0.051 ppm of total cyanide and 0.006 ppm of cyanide amenable to chlorination. Production Well #3 contained 0.020 ppm of total cyanide and 0.010 ppm of cyanide amenable to chlorination. The contaminated on-site drinking water (Production Well #1) was no longer utilized as a source of potable water. The well is still utilized as a source of industrial water for the facility. At present, NSA utilizes the municipal water supply for all potable water.

7.0 SUMMARY OF SITE RISKS

A formal Baseline Risk Assessment has not been conducted for the NSA Site, but will be conducted during the RI/FS. The Agency's decision to initiate Interim Remedial Action at this Site is based on data collected during previous Site investigations. This information indicates that hazardous substance releases from this Site are migrating in onsite ground water through the unconsolidated alluvial aquifer toward the Ohio River less than 3/4 mile away. Primary contaminants of concern in both the North and South Plumes are: (but are not limited to) cyanide, arsenic, barium, manganese, lead, nickel, and fluoride. This Interim Remedial Action will be conducted to address the most imminent and substantial problem identified thus far at the NSA Site. This Interim Remedial Action will prevent ground water contamination in the North and South Plumes from spreading and also to begin ground water restoration activities. Ground water restoration activities as described in this ROD, will not include leachate within the landfilled areas. Preliminary sampling in this area has identified PCBs, volatile and semi-volatile organic compounds (VOCs) in the leachate of the Taylors Wash Landfill. Further information will need to be obtained during the RI/FS for the Taylors Wash Landfill and other landfilled areas prior to initiating future remedial activities.

Concentrations of cyanide in onsite ground waters have been identified up to 56 ppm (24 ppm amenable cyanide) with the MCL at 0.2 ppm. Fluoride was identified at levels up to 1770 ppm with the MCL at 4.0 ppm. Nickel was identified at levels up to 170 ppb with the MCL at 100 ppb. Manganese was detected at levels up to 8,400 ppb and the SMCL is 50 ppb. Lead was identified at levels up to 110 ppb with the action level at 15 ppb. Levels for these specific contaminants of concern in the ground water are far above levels allowed by either the EPA or the Commonwealth of Kentucky. In response to the well documented contamination of the unconsolidated alluvial aquifer near the Potliner Disposal Area and in the vicinity of the Spent Potliner Accumulation Building, the Agency has decided that containment of the contaminant plumes and initial cleanup activities should be initiated.

Hazardous substances have been or are being released from the Site in other than a controlled manner. Some of these contaminants found at the Site are acutely toxic at extremely low levels, and, at sublethal levels, they tend to bioconcentrate. These contaminants, other than PCBs, are readily soluble and have leached or migrated from soils into the groundwater. Cyanide that is a by-product of primary aluminum production is extremely toxic at low levels. Exposure to cyanide can cause a wide variety of health problems including: central nervous, respiratory, and cardiovascular system problems. Fluoride is a by-product of the ionization of cryolite, and is concentrated as a waste product as a result of the air emissions filtration system at the Site. In the environment, fluorides are soluble and can result in a variety of toxicological effects, including fluorosis, a syndrome resulting from chronic exposure and characterized by bone and tooth damage. PCBs are oil-based contaminants that are not readily soluble, can be carcinogenic and tend to bioconcentrate. Calcium fluoride is present at the Site in most media.

The manufacturing facility is externally fenced; however, the surface impoundments are not isolated by fencing from other portions of the Site such as the adjacent airfield. There are no barriers to human or wildlife movement between the surface impoundments and this public airfield.

8.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

The following alternatives were evaluated by EPA using the nine evaluation criteria.

1. No Action;

2. Implementation of a multiple-well gathering and pump and treat system to remediate two onsite plumes containing cyanide and metals contamination in the unconsolidated aquifer. The exact number of withdrawal wells for each plume will be fully evaluated and determined during the Remedial Design phase of the Superfund process.

8.1 Alternative 1: No Action

- The EPA requires that this alternative be evaluated at every site to serve as a baseline for comparison for all other alternatives considered. Under this alternative, no groundwater remediation would take place. The only reduction of contaminant levels that could potentially occur would be via natural processes such as dispersion or attenuation. There would be no associated costs with this alternative.

8.2 Alternative 2: Pump and Treat System

- Implementation of a multiple-well gathering and pump and treat system to remediate two onsite plumes which contain cyanide and metals contamination in the unconsolidated aquifer.

- The withdrawal wells will be installed in the unconsolidated aquifer in strategic positions to recover the maximum amounts of contaminated ground water. Intermittent pumping on a varying selection of the wells within each plume will be utilized to manage the plumes and control cyanide concentrations in ground water influent to the treatment plant.

- The treated effluent water will be discharged into the Ohio River. Cleanup attainment levels are presented in Tables 4A & 4B (Refer to Section 10.1, Performance Standards). System Operating Parameters are shown on Table 5 (Refer to Section 10.1, Performance Standards).

- Approximately 2.5 tons of sludge will be generated daily by the process, which will be handled and disposed of in an EPA approved disposal facility.

Construction cost	$1.7 million
Annual operation and maintenance costs	$570,000
Months to implement	6 months

The extraction well and pump and treat system will limit the offsite spread of contaminated ground water in the unconsolidated aquifer. The volume and amount of hazardous contaminants within the aquifer will also be reduced. This action will achieve significant risk reduction early in the Superfund process.

9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section provides the basis for determining which alternative for this limited scope Interim Remedial Action: 1) meets the threshold for overall protection of human health and the environment and compliance with ARARs, 2) provides the "best balance" between effectiveness and reduction of toxicity, mobility, or volume through treatment, implementability, and cost, and 3) demonstrates state and community acceptance. A glossary of the evaluation criteria is provided in Table 3.

9.1 Overall Protection of Human Health and the Environment

The only alternative that would sufficiently be protective of human health and the environment for this Interim Remedial Action would be Alternative 2. The "No Action" Alternative is not protective because it does not address the most significant threats from the ground water plumes to human health and the environment at the NSA Site. Therefore, the "No Action" Alternative will not be considered further in this analysis as an option for the Site. Alternative 2 is protective of human health and the environment since it reduces or controls significant and immediate threats from two onsite ground water plumes containing significant levels of cyanide. The extraction well and pump and treat system will also limit the potential spread of contamination onsite.

9.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternative 2 will meet all State and Federal ARARs concerning the implementation of the extraction well and pump and treat system. The ground water treatment plant will meet all ARARs discharged to surface water. All activities concerning handling and disposal of the sludge generated from the operation will be disposed of at an EPA approved disposal facility.

Resource Conservation and Recovery Act (RCRA) [42 U.S.C. 6921-39 (3001-19), 40 CFR Parts 260-270], and Kentucky solid hazardous waste regulations (401 KAR 30-35, 37, 47, and 48), regulate the treatment, storage, and disposal of hazardous waste from generation through ultimate disposal. All activities concerning handling and disposal of the sludge generated from the operation will be in compliance with State and Federal ARARs. Waste sludge (2.5 tons per day) will be disposed of at an EPA approved disposal facility.

All manifesting and generator requirements cited in CFR 262 and 264 will be met during this CERCLA response action. Under RCRA policies and regulations (derived from rule) (Contained in policy) the groundwater is considered to be a hazardous waste because it contains constituents derived from the listed hazardous waste, K088, spent aluminum potliners. Normally 40 CFR Part 264, Subpart I, Tanks, would be applicable to storage of hazardous wastes; however, it is not applicable here because the pump and treat system is a contained system and is therefore exempt under 264.10(g)(6) as a waste water treatment unit. Disposal of waste water from the pump and treat system will also not be regulated under RCRA because it will be disposed of under a KPDES permit.

RCRA Land Disposal Restrictions (LDRs) will not be applicable or relevant and appropriate for this Interim Remedial Action. However, it is anticipated that the treatment residual will contain the K088 listed waste for spent potliners from primary aluminum reduction (which contains cyanide), and disposal facilities receiving the treatment residuals (sludge) should handle of the sludges in compliance with RCRA LDRs.

RCRA requirements may include LDR and waste generator requirements set forth in 40 CFR Part 268.7 and Part 262. Any offsite facility receiving the hazardous waste for disposal will meet the requirements set forth in 268.41. Because the Commonwealth of Kentucky may be authorized for some or all of the RCRA provisions, the applicable regulations are hereby incorporated by reference.

While MCLs are relevant and appropriate for final groundwater cleanup at this Site, this remedy is primarily a source control remedy for containment of two contaminated water plumes and does not address the final cleanup. The final cleanup levels for the ground water are not addressed in this Interim Remedial Action ROD because such goals are beyond the limited scope of this action. The final cleanup levels will be addressed and will be met by the Final Remedial Action ROD for the Site. Thus, to the extent that this Interim Action remedy addresses remediation of the groundwater an interim action waiver pursuant to CERCLA Section 121(d)(4)(A), 42 U.S.C. 9621(d)(4)(A), for the final cleanup ARARs, including MCLs and other relevant cleanup levels is hereby invoked. However, it is expected that continued implementation of the extraction well and pump and treat system will specifically reduce levels of cyanide to the MCL of 0.2 ppm which applies to "free cyanide" (40 CFR Parts 141 and 142; National Primary Drinking Water Regulations; Vol 57, No. 138, July 1992). This guidance further states, "EPA is specifying the use of the "cyanide amenable to chlorination" test for determining the "free cyanide" concentrations, while the "total cyanide" analytical technique is being allowed to screen samples".

Previous analytical results at the NSA Site for cyanide (total, and amenable - as a measure of "free cyanide") have all indicated that cyanide levels in the ground water plumes are orders of magnitude above the MCL. The previous analytical results for "total cyanide" have been very consistent while the previous analytical results for "amenable cyanide" as a measure of the "free cyanide" have been variable (even though results were variable, all analyses for the main portion of the North Plume were consistently orders of magnitude above the MCL, while levels for the South Plume were noted to be significantly elevated). In response to the previous variable results for "amenable cyanide" at the NSA Site, it will be necessary during the Remedial Design for the Interim Remedial Action to utilize different or enhanced analytical techniques to consistently identify the amount of "free cyanide". If consistent procedures or analytical techniques cannot be successfully be determined as part of the Remedial Design, then the cleanup level (0.2 ppm) for effluent or waters discharged to the Ohio River should be applied to "total cyanide". This cleanup level would be justified since the "free cyanide" would be a variable portion of the "total cyanide".

Within this Interim Action ROD, the term "amenable cyanide" is used since much of the previous analytical data utilized this terminology, and it should be noted that this was utilized in order to determine the "free cyanide".

Concerning KPDES standards (Table 4A), Treatment Plant Effluent Standards and the Kentucky Water Quality Standards (Table 4B), these levels will be attained prior to treated waters being discharged into the Ohio River (refer to Section 10.1, Performance Standards). A list of the major ARARs that pertain to the NSA Site Interim Action is presented below.

9.2.1 Action Specific ARARs

Pertain to performance, design, or other similar action-specific requirements that impact particular remedial activities.

- Kentucky Pollutant Discharge Elimination System [KPDES (401 KAR 5, specifically Parts 031, 065, and 075)], Kentucky Water Quality Regulations are applicable to this response action because they regulate the point-source discharge of treated ground water to the Ohio River by setting discharge limitations and monitoring requirements. This response action shall abide by the substantive requirements of regulations set by the Commonwealth of Kentucky, which has been authorized to implement the National Pollutant Discharge Elimination System program under authority of the Clean Water Act (CWA 402). Section 402 of the CWA incorporates sections 301, 302, 306, and 307.

- KRS 151.140 is applicable to this response action because it regulates the withdrawal of water from public waters within the Commonwealth of Kentucky. This response action will comply with all substantive requirements of this regulation.

- 401 KAR 5:005: Kentucky's Waste Water Treatment Plant Design Criteria are applicable requirements for the design of the treatment system to be used at the Site.

- KRS224.01-400: Hazardous Substance Remediation Provisions are applicable when a release or threatened release of a hazardous substance occurs.

9.2.2 Location Specific ARARs

Complications or additional problems may develop when hazardous waste cleanup occurs in specific locations. Location Specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because these activities are being conducted in a specific location.

- 40 CFR 264.18(b), Floodplain Management, mandates that hazardous waste treatment, storage or disposal facilities located within a 100-year floodplain must be designed, constructed, operated and maintained to avoid washout. This regulation is applicable because a large portion of the Site is located within the 100-year floodplain of the Ohio River.

- 40 CFR 6.302, Floodplain Management Executive Act, (Executive Order 11988): Actions in floodplains are required to avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values.

9.2.3 Contaminant Specific ARARs

These ARARs are health or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. These ARARs set protective cleanup levels for the contaminants of concern in the designated media or indicate and acceptable level of discharge into a particular medium during a remedial activity.

For this Interim Remedial Action, Maximum Contaminant Levels (MCLs) [Safe Drinking Water Act (40 CFR Part 141)] are not relevant and appropriate requirements since the "interim" cleanup is intended to implement source control measures for onsite ground water plumes. MCLs are not a contaminant specific ARAR since no final cleanup measures will be implemented as part of this "interim" remedy.

- Clean Water Act (40 CFR Part 122): National Pollutant Discharge Elimination System (NPDES). This ARAR is applicable concerning point source discharges.

- Clean Water Act (40 CFR Part 125): Criteria and Standards for the National Pollutant Discharge Elimination System (NPDES) are applicable to point source discharges.

- Clean Water Act (40 CFR Part 133): Secondary Treatment Regulation is applicable because hazardous waste derived from industrial waste will be discharged into United States navigable waters.

- 402 KAR 5: 029 and 5:031: Water Quality Standards are applicable because they pertain to point source discharges at the Site.

9.3 Long-Term Effectiveness and Permanence

Interim measures (Alternative 2) as described in this document will not provide any degree of long-term effectiveness concerning remediation of source waste at the NSA Site. However, the extraction well and pump and treat system will permanently eliminate contaminants from extraction well waters prior to treated water discharge in the Ohio River. The primary goal of the Interim Remedial Action is to address the most imminent and substantial problems at the Site. This will occur while the RI/FS and Post RI/FS activities are being completed. Alternative 2 is consistent with the Agency's long-term goal of restoration of Site and adjacent area ground water. In addition, the two onsite cyanide plumes will be hydraulically controlled to reduce the possibility of offsite migration. This will offer significant advantages during implementation of the Final Remedy for the Site.

Additional data will be generated during implementation of the Interim Remedial Action. This information concerning hydraulic conductivity and aquifer response will be used in conjunction with RI/FS data to facilitate Final Remedy selection. Long-term effectiveness and permanence will be more thoroughly evaluated at that time.

9.4 Reduction of Toxicity, Mobility, and Volume

Alternative 2 will effectively reduce toxicity and mobility of contaminants (specifically cyanide) in the ground water plumes at: 1) the waste water impoundment areas, and 2) under and near the Spent Potliner Accumulation Building (formerly the Dump Pad). Contaminants withdrawn from the extraction wells will be permanently eliminated. It is expected that contaminant levels within the two onsite ground water plumes will be significantly reduced through implementation of the ground water extraction pump and treat system. Continued implementation of the system may potentially reduce the volume of contaminated waters in the alluvial aquifer. During the RI/FS, the onsite source will be thoroughly evaluated and appropriate action will be taken as part of the Final Remedy to insure continued ground water contamination does not occur.

9.5 Short-Term Effectiveness

Significant short-term effectiveness will result from implementation of Alternative 2. The Interim Remedial Action is effective in the short-term because it would significantly reduce the potential threats from contaminants in the two onsite ground water plumes. However, short-term risks will be slightly elevated during transfer of sludge from the: 1) sludge holding tank, 2) sludge transfer area, 3) solids collection area, or 4) the filter press area to transport and disposal facilities. These 4 system areas will be routinely maintained and associated risks are expected to be minimal.

9.6 Implementability

The implementability of Alternative 2 is based on technical feasibility, administrative feasibility, and availability of services and materials. Alternative 2 is readily implementable since the ground water extraction pump and treat system is a prepackaged system that has been implemented at numerous sites with metals/inorganic contamination in the ground water (information is included as part of the Administrative Record for the Site). A treatability study was performed on samples of the contaminated ground water to determine the optimum conditions to remove the metals, cyanide, and fluoride. The study determined that the chemical coagulation/precipitation process would be a viable technology for treating contaminated ground water at the NSA facility. Test samples of contaminated ground water were run through 8 separate runs to confirm the effectiveness of this process. Treatability testing results indicated that "total cyanide" and "amenable cyanide" (free cyanide) will be effectively reduced to the 0.2 mg/l MCL. [It should be noted that the treatability testing indicated that cyanide amenable to chlorination was not effective in reducing cyanides. However, as was previously stated in Section 9.2, a consistent analytical technique to identify "free cyanide" will have to

be demonstrated during the Remedial Design, otherwise the cleanup level to be attained for effluent or waters discharged to the Ohio River will be 0.2 for "total cyanide"]. Other metals and fluoride will also be effectively reduced to Federal and State of Kentucky regulatory limits.

There are no expected difficulties concerning administrative feasibility or availability of services or materials for the implementation of Alternative 2.

9.7 Cost

Alternative 2 has a present worth cost of $1.7 million. The annual operation and maintenance cost will be $570,000. Additional areas of contamination that are not addressed during this Interim Remedial Action will be evaluated during the RI/FS. The associated cleanup costs for these areas will be evaluated after this information is obtained during these investigations.

9.8 State Acceptance

The Commonwealth of Kentucky has assisted in the Superfund process through review of documents and submittal of significant comments. The State has reviewed the Proposed Plan and Interim Remedial Action Record of Decision and concurs with the selection of these "Interim" Remedial Actions.

9.9 Community Acceptance

A Public Meeting to present the Proposed Plan was held on 1/19/93 at the Hancock County Middle School near Hawesville, Kentucky. Comments from the public during the meeting were supportive of the Interim Remedial Action proposed for the NSA Site. The Public Comment Period was held from 1/7/93 to 2/7/93. No extension to the comment period was requested.

10.0 THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternative, and public comments, EPA has determined that the activities as described in Alternative 2 (Section 8.2, p. 41) constitute an appropriate Interim Remedial Action until a Final Action for the Site is determined. A prepackaged pump and treat system utilizing extraction wells is being proposed to limit the spread of contaminants in the unconsolidated alluvial aquifer and to begin ground water cleanup activities. This system, as investigated by NSA, offers a wide range of treatment features and appears cost effective. Cleanup attainment levels are presented in Tables 4A & 4B (Refer to Section 10.1, Performance Standards). The major goal of this Interim Remedial Action is to reduce risks at the Site by eliminating or controlling the most imminent and substantial threats to human health and the environment. Additional goals of this Interim Remedial Action are to derive valuable information concerning aquifer characteristics that would potentially assist in implementing the Final Remedy.

A Treatability Study was performed on contaminated ground waters from the NSA Site. This study determined that Alkaline Chlorination would not be an effective method for elimination of cyanide, metals, and fluoride from the ground water. However, the study did determine that a Chemical Coagulation/Precipitation process did effectively remove contaminants to acceptable levels. Since a successful Treatability Study has already been performed on contaminated ground water samples, significant modifications to either the procedure or apparatus are not expected during the Remedial Design and Remedial Action (RD/RA). However, normal modifications may be implemented in order to enhance the performance of the pump & treat apparatus.

This treatment system as proposed to EPA by NSA, utilizes ferrous precipitation and settling to

remove cyanide from ground water entering the system. The process will also lower incidental levels of multivalent metals. The treatment process consists of the following five levels:

1) Cyanide Precipitation

2) First Stage Clarification

3) Chemical Coagulation/Precipitation Process

4) Second Stage Clarification

5) Solids Dewatering

In level 1, Cyanide Precipitation, excess ferrous chloride (FeCl[2]) or ferrous sulfate (FeSO[4]) is added to the ground water in order to precipitate ferricyanide (Fe(CN)6[-3]). The solids in the effluent are then separated from the liquid phase by gravity settling in level 2, First Stage Clarification. The clarified effluent from level 2 then enters level 3 where the residual soluble ferrous iron (Fe[2+]) is removed from the liquid phase. Removal is achieved through air oxidation and precipitation as ferric hydroxide (Fe(OH)[3]). Additional solids are removed by settling from the level 3 treated ground water during level 4, Second Stage Clarification. The clarified effluent is then discharged from the system. In level 5, Solids Dewatering, the liquid phases remaining in the sludges produced during previous levels, are collected and re-routed to level 1. The treated effluent water will be discharged into the Ohio River. The discharge will be treated to meet the standards shown on Table 4A (Refer to Section 10.1, Performance Standards). Approximately 2.5 tons of sludge will be generated daily by the process, which will be handled and disposed of in an EPA approved disposal facility.

In appendix A.4, additional preliminary information on the design of the gathering system and treatment plant are presented together with a technical memorandum on preliminary ground water flow modeling of the effects of the pumping system. Also in Appendix A.4 are the conclusions of a treatability study for the ground water.

At the end of the five-year period following this Interim Remedial Action, a review will be conducted. If subsequent remedial activities are initiated prior to the close of the five-year period following the Interim Remedial Action, a review will be conducted prior to any initiation of additional work at the NSA Site. The review will be conducted to insure that the extraction well and pump and treat system are, and have been functioning as designed and that the "interim" activities are, and have been effective in reducing the threat to human health and the environment.

10.1 Performance Standards

Performance Standards for the ground water pump and treat system are presented in Tables 4A & 4B. Emissions from the system would meet Treatment Plant Effluent Standards for: 1) the Ohio River Valley Water Sanitation Commission (ORSANCO), 2) warm water aquatic habitat acute criteria (Commonwealth of Kentucky), and 3) warm water aquatic habitat chronic criteria (Commonwealth of Kentucky). These performance standards are not MCLs (refer to Section 9.2, p. 46-47 for a discussion of sludge disposal standards).

The discharge limits contained in Table 4A are those currently proposed by the Commonwealth of Kentucky Division of Water. The permit with which these discharge limits shall comply is currently subject to public comment, therefore, these discharge limits may be amended. If the final KPDES requirements vary from those listed in this table, the final discharge limits are hereby incorporated by reference and will replace those listed in Table 4A.

10.1.1 Ground Water Withdrawal Limits

Ground water withdrawal limits will be evaluated during the Remedial Design. The ground water withdrawal criteria to be evaluated include: 1) availability, 2) reasonable use, and 3) impact on other users of the resource. The Commonwealth of Kentucky Water Resources Branch have performed a preliminary review concerning the implementation of the pump & treat system and believe that ground water availability will not be a problem. However, they have suggested that the impact on other users be further evaluated during the Remedial Design.

10.2 System Operating Parameters

The operating parameters under which the ground water pump and treat system shall operate are presented in Table 5.

10.3 ARAR Requirements

The following major ARARs shall be met for the ground water contaminants of concern for this Interim Remedial Action.

Treated ground water discharged to the Ohio River shall comply with applicable KPDES limits. State ground water withdrawal requirements shall be observed. Solid wastes and sludges generated from the pump and treat system will be regulated as K088 listed hazardous wastes (wastes derived from spent potliners). Applicable manifest and generator requirements as cited in CRF 262 and 268 shall be met during this CERCLA response action.

11.0 Statutory Requirements

The U.S. EPA and the Commonwealth of Kentucky believe that the activities included in the Interim Remedial Action satisfy the statutory requirements of providing protection of human health and the environment, attain ARARs directly associated with this action and will be cost-effective. Sections 11.1 through 11.6 summarize the statutory requirements for the Site.

11.1 Protection of Human Health and the Environment

The activities previously described concerning this "interim" action will provide protection of human health and the environment through extraction and treatment of contaminated ground water at the NSA Site. Implementation of the Interim Remedial Action activities will not pose unacceptable short-term risks or cross-media impacts.

11.2 Attainment of ARARs

Although this is an Interim Remedial Action, it is expected that the cleanup levels attained for the treated ground waters discharged to the Ohio River will be consistent, and in compliance with Federal and State ARARs as identified in Section 9.2 of this document. Treatability Study results and preliminary test sampling indicate that performance standards for the ground water pump and treat system will attain ARARs. The final cleanup levels for the ground water are not formally addressed as part of this Interim Remedial Action. However, the final cleanup goals for the Site are expected to be consistent with those cited in the Safe Drinking Water Standards Current, and Proposed MCLs, MCLGs, and SMCLs.

11.3 Cost Effectiveness

This Interim Remedial Action employs proven technologies that will be applied to contaminated ground waters that presently reside on the NSA Site. The selected remedy affords overall

effectiveness concerning remediation of cyanide, metals, and fluoride from ground water. Considering the toxicity of cyanide, and the effectiveness of the system as indicated by Treatability Testing, Alternative 2 provides a sufficient margin of protection proportional to its cost.

11.4 Utilization of Permanent Solutions and Alternative Treatment Technology or Resource Recovery Technologies to the Maximum Extent Practicable

Although this Interim Remedial Action is not intended to utilize permanent solutions for the NSA Site, pump and treat activities will permanently remediate ground waters extracted from the alluvial aquifer that are discharged to the Ohio River. The EPA will continue to evaluate long-term effectiveness and permanence as part of the development of the final action for the Site. Subsequent actions will provide a final resolution to Site conditions, the majority of which will be controlled through implementation of this Interim Remedial Action. This action is limited in scope and not expected to be final. However, this remedial activity does represent the best balance of tradeoffs among alternatives with respect to pertinent criteria.

11.5 Preference for Treatment

The CERCLA statutory preference for treatment requires that waste treatment be thoroughly evaluated and if possible, treated to reduce or eliminate the threats from hazardous wastes or materials. This interim remedy satisfies this CERCLA statutory requirement through treatment of contaminated ground water via a ground water extraction pump and treat system. This Interim Remedial Action will not necessarily be the final solution for Site contamination, but through chemical coagulation/precipitation it will effectively reduce levels of cyanide, metals, and fluoride in extracted ground waters to levels at or below promulgated standards.

APPENDICES

Appendix A: Technical Information

A.1) Technical Memorandum #1 (Drilling and Monitoring Well Installation)
A.2) Technical Memorandum #2 (Ground Water Sampling)
A.3) Technical Memorandum #7 (Aquifer Pump Test)
A.4) Technical Memorandum #8 (Ground water modeling & Treatability Study for Ground Water)
A.5) Analytical Analyses from LSI Report (11/89-1/90).
A.6) Summary of Monitoring Wells Installed at the NSA Site.

Appendix B: Copy of the Proposed Plan Presented at the Public Meeting, January 19, 1992, Hawesville, Kentucky.

Appendix C: Information Repository Location

Appendix D: Letters of Concurrence

APPENDIX A.1

TECHNICAL MEMORANDUM #1
DRILLING AND MONITORING WELL INSTALLATION

TECHNICAL MEMORANDUM NO. 1

SITE: NSA a Division of Southwire Company
LOCATION: Hawesville, Kentucky
JOB NO. 22784-005-121
CLIENT: NSA

DRILLING AND MONITORING WELL INSTALLATION

Drilling and installation of the new monitoring wells (MW-201D, MW201I, MW-201S, MW-202D, MW-202I, MW-203D, MW-203I, MW-203S, MW-204D, MW207, MW-208I, MW-209I, MW-210I, MW-211I, MW-212I, MW-213I, and MW-214S) was conducted by Fugro-McClelland, Inc. (Fugro-McClelland) of St. Louis, Missouri under the technical supervision of a Dames & Moore geologist. A Central Mine Equipment Company Model 750 rotary drill rig, mounted on an all terrain vehicle (ATV), equipped with 4-1/4-inch inside diameter (ID) hollow-stem augers was used for the drilling and well installation. The well installation was completed between February 26 and April 7, 1992

All drilling and sampling equipment and tools were steam-cleaned and inspected for signs of contamination prior to the onset of drilling activities at each drilling site. Split spoons were steam-cleaned or cleaned in a detergent wash and double rinsed with potable water between each sample.

Boreholes were advanced through unconsolidated sediments using hollow-stem augers. Hollow-stem augering advances the borehole by rotating and pressing the augers into the soil. As this occurs, soil cuttings are rotated upward by the auger flights to the ground surface.

Split-spoon soil samples were obtained from each borehole, at 5 foot intervals as drilling progressed. A 2-inch outside diameter (OD) split spoon, driven by a 140-pound hammer falling 30 inches was used. The samples were examined and classified according to the Unified Soil Classification System (USCS) and logged on Dames & Moore boring log forms. In locations where monitoring well clusters were installed, only the deep well was sampled and logged. Also recorded on the boring logs were sample time, sample interval, and blow counts for the Standard Penetration Test (SPT).

Ground water samples were collected from the deep monitoring wells and selected intermediate wells during drilling using a Grunfos RediFlo 2 submersible sampling pump. Samples were collected at 20-foot depth intervals, with the first sample collected at the top of the water table. The pump and discharge hose were decontaminated by steam cleaning the exterior and flushing the interior with potable water. The volume of water standing in the augers was calculated and purged by initially pumping from the top of the water column. After one volume of water was removed from inside the augers the pump was lowered to the sampling depth and at least one more volume of water was purged. The water sample was then collected, preserved with sodium hydroxide, stored on ice in a cooler, and delivered to NSA's onsite laboratory for total cyanide analysis. Results are shown on the attached Table TM1-1.

The total cyanide results from water samples taken while drilling the deep wells were used to determine the depth of maximum cyanide concentration. The intermediate wells were drilled to the depths determined. Test results from the water samples taken from the intermediate wells during drilling were used to ensure the wells were delineating the lateral limits of the cyanide plume.

In borings 205I and 206I cyanide contamination was above the Maximum Contamination Limit (MCL). These borings were backfilled with grout and new wells were located and drilled to better define the extent of contamination.

All the wells were constructed of 2-inch-ID stainless-steel casing equipped with a 10-foot section of 10-slot stainless-steel screen. A commercial filter pack consisting of No. 5 silica sand was placed along the entire length of and 5 feet above the well screen. The remaining annulus was filled with thick Volclay bentonite sealer extending up to just below the frost line. The annulus from below the frost line to the surface was filled with concrete, which blended to a 3 feet diameter, 4-inch-thick pad on the surface. A lockable protective steel casing was set in the concrete pad and 4-inch diameter steel posts set in concrete were placed around the wells to protect them. The protective casing and steel posts were painted high-visibility yellow.

On April 22, 1992 the locations of the new and existing wells were surveyed by Johnson, Depp, and Quisinbury, of Owensboro, Kentucky. The top of inner casing elevations were also surveyed to within 0.01 for above msl.

The wells were developed and sampled following installation using the Grundfos pump. A minimum of 15 well volumes of water were removed during development. The well screens were surged with the pump during development. Development water was contained and then added to the makeup water of the air control system.

APPENDIX A.2

TECHNICAL MEMORANDUM #2
GROUND WATER SAMPLING

TECHNICAL MEMORANDUM NO. 2

SITE: NSA a Division of Southwire Company
LOCATION: Hawesville, Kentucky
JOB NO. 22784-005-121
CLIENT: NSA

GROUND WATER SAMPLING

NSA monitoring wells (MW-201D, MW-201I, MW-201S, MW-202D, MW-202I, MW-203D, MW-203I, MW-203S, MW-204D, MW-207, MW-208I, MW-209I, MW-210I, MW211I, MW-212I, MW-213I, IW-1, IW-2, IW-3, NSA-1, NSA-5, 102, 103, 104, 105, 106, 107, 109, 110, 111, 112, 2, 3, 4, 5, 8, 11, 12) and United States Environmental Protection Agency (U.S. EPA) monitoring wells (MW-1, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10) were sampled from April 21 to 28, 1992 and on May 13, 1992, respectively, as part of the cyanide investigation. The U. S. EPA wells were sampled under the supervision of a U.S. EPA representative. Samples collected from all the wells were analyzed for total and amenable cyanide. In addition, wells MW-207, 3, 11, 13, IW-1 were sampled as part of the PCB investigation and analyzed for PCB concentration

The sampling team coordinated sampling activities prior to the sampling events. Wadsworth/ALERT Laboratories, Inc. (Wadsworth) of North Canton, Ohio was selected as the analytical laboratory for the cyanide analyses. Technical Testing Laboratories (TTL) was selected as the analytical laboratory for the PCB analyses. Sample containers and appropriate preservatives were shipped in coolers by Wadsworth and TTL to the NSA site. Upon arrival the contents of the coolers were inspected to confirm that the appropriate type and number of sample containers and preservatives had been sent. The contents were also inspected for damage or tampering that may have occurred during shipment.

All reusable equipment was collected and decontaminated before traveling to the field. All disposable equipment (bailers, bailer cord, distilled water, etc.) was compiled prior to arriving onsite. Immediately prior to use, the pH meter was calibrated with pH 7.0 and pH 10.0 standard buffer solution.

The sampling event was initiated by measuring the depth to water and total well depth with an electronic water level indicter. This information was recorded on the "Measurement of Ground Water Levels" form. The depth information was transferred to "Well Data Sheet" form and the volume of standing water in the well was calculated. In addition, the wells were checked for aboveground condition.

All wells were purged with stainless-steel bailers, except MW-207, 3, 11, and 12, where disposable polyethylene bailers were employed. The bailers were raised and lowered in the wells using a new length of plastic coated nylon cord for each well. As the bailer was withdrawn the cord was coiled to prevent contact with the ground and cross contamination. All wells were purged until at least three well volumes were removed. Physiochemical parameters (temperature, pH, and specific conductance) were then monitored and purging continued until all parameters were stable over three consecutive readings. The sample was then obtained from the bailer in use. The bottles were filled without splashing or otherwise aerating the sample.

The sample containers were then labeled with site name, well I.D., samplers initials, time,

date, analytic parameters, and preservatives were added to the samples. The samples were then placed in coolers with blue ice and recorded on a chain-of-custody form. The samples were shipped via overnight courier to Wadsworth and TTL under proper chain-of-custody procedures.

All reusable sampling equipment was thoroughly decontaminated prior to use. The water level indicator and pH-conductivity meter were rinsed with distilled water between wells. Stainless-steel bailers were decontaminated prior to the initiation of field work by a laboratory grade detergent wash, tap water rinse, and a triple distilled water rinse. They were then wrapped in aluminum foil and rinsed again with distilled water immediately prior to use in the field. Bailers that were reused in the field were washed with a laboratory grade detergent solution and triple rinsed with distilled water. Disposable bailers were sealed in plastic from the manufacturer. They were triple rinsed with distilled water prior to use.

The monitoring wells surrounding the dump pad were sampled first and the wells associated with the disposal ponds were sampled second. The U.S. EPA wells were sampled 2 weeks later because an U.S. EPA representative had to be present to gain access to the wells. In total, 46 wells at NSA were sampled.

Five wells were not sampled due to conditions of the well. NSA-3 and NSA-4 were dry. The protective steel casing for 108 still exists but the well appeared to be plugged. An obstruction that could not be passed by a bailer was present at 36.3 feet below the top of casing of MW-2. Some unknown piece of heavy equipment has damaged MW-6 and knocked flat two of the three protective steel posts surrounding the well. The concrete well pad appeared to have moved slightly. A bailer would not pass below 5.3 feet below the top of casing.

APPENDIX A.3

TECHNICAL MEMORANDUM #7
AQUIFER PUMP TEST

TECHNICAL MEMORANDUM NO. 7

SITE: NSA a Division of Southwire Company
LOCATION: Hawesville, Kentucky
JOB NO.: 22784-005-121
CLIENT: NSA

AQUIFER PUMPING TEST

Site-specific estimates of aquifer characteristics were obtained through performance of an aquifer pumping test in June 1992. The test was conducted by observing and recording the aquifer response to changes in pumping of NSA production well 1. NSA uses three onsite pumping wells to supply water for various uses onsite, one of which was shut down for approximately 2.5 days in June. This provided the opportunity to observe the aquifer's response to first the stopping of pumping, then the renewed pumping. Details of the activities involved in the collection and evaluation of the test data and the results of the effort are presented below.

Preparations for the aquifer test began on June 5, 1992 with the inspection and installation of the data collection and logging equipment. This equipment consisted of two HERMIT Model SE1000C data loggers and three model PTX-161/D pressure transducers. Together, this equipment monitored the water level response to instantaneous changes in head. Prior to installation, the HERMITs and transducers were examined for shipping damage and a check test was set up and run to insure the electronic loggers were functioning properly.

Pressure transducers were placed in piezometers P-1 and P-2, and well 8 with the transducer lines secured to the wellhead with duct tape to ensure stable positioning in the well. The monitored well/piezometers were chosen based on their location relatively close to the pumping well (see attached site layout diagram).

The transducer in well 8 was connected to one HERMIT data logger, and the transducers in P-1 and P-2 were connected to the second HERMIT. The HERMITs were pre-set to record displacement in feet taking readings at a logarithmic rate for the first 15 minutes of the tests. The internal clocks of the HERMITS were synchronized so that they would run identical, simultaneous tests.

The first test, run to record background changes in water levels during normal pumping operations at NSA production well 1, was started on the evening of June 5, 1992 and stopped manually on the morning of June 8, 1992. The HERMITs were then zeroed and reset, and the second test started when the production well was shut down June 8. This test was run for approximately 2.5 days in order to record the aquifer's recovery from the pumping stress.

On June 10, 1992, the second test was stopped and the HERMITs were zeroed and reset to record a third test. The third and final test was started at the same moment the production well was re-activated, and recorded the aquifer response to resumed pumping stress. This test was stopped on June 15, 1992 after approximately 5 days.

Data from the loggers were downloaded to spreadsheet and graphing computer programs for evaluation of the aquifer characteristics of transmissivity and storativity as discussed below.

As mentioned above, changes in piezometric levels were measured and recorded at one well and two

piezometers during three time periods: background, recovery test (production well 1 shut down), and drawdown test (well 1 pumping resumed). The background data were used to evaluate what ambient ground water fluctuations would have persisted through the test. The test data were used in the calculation of aquifer parameters.

The background data indicate sharp fluctuations of ground water levels of a much as 0.1 to 0.2 feet at the observation points (well 8, P-1, and P-2; see attached graphs). These fluctuations are attributable to the pumping pattern of the test well (production well 1). The well is used in part for non-contact cooling of the pigging wheel. The cooling system is often bypassed (potentially 2 to 3 times a day), creating a change in pressure on the system. As a result, the wells production rate changes, and ground water levels fluctuate accordingly. Because of the strength and irregularity of the fluctuations produced by this bypassing, no other trends in the background data were identified. The fluctuations ceased when production was stopped and did not interfere with the recovery test.

The recovery data were evaluated using the Theis recovery method (see attached graphs). The early portion of the test data appear to have been skewed by the effects of elastic storage and potentially by increased pumping from production wells 2 and 3. The later data for P-1, which were found to conform most readily to the requirements of the evaluation, yielded a hydraulic conductivity estimate of approximately 500 ft/day (approximately 0.2 cm/s).

The drawdown test data were evaluated using the Theis curve-fitting method and the Jacob's straight-line methods (time-drawdown and distance drawdown methods; see attached graphs). The evaluations yielded values of hydraulic conductivity in the range of 0.14 to 0.85 cm/s as indicated on Table B-1. By discarding the values derived from well 8, which, being the furthest data point from the pumped well is most likely to be influenced by background noise, the agreement becomes even better (0.15 to 0.4 cm/s). The average hydraulic conductivity value produced by these evaluations is 0.25 cm/s (approximately 700 ft/day).

Storage coefficient is a unitless measure of the ability of the aquifer to release water from storage. The higher the storage coefficient, the more readily the aquifer will yield water to a well. The estimated values of storage coefficient range from 0.01 to 0.3 (excluding values derived from well 8 data), which are similar to the range of values observed in other unconfined aquifers. The storage coefficient values are more variable than the values of hydraulic conductivity obtained through these evaluations. This may be partially influenced by changes in the pumping of production wells 2 and 3 during the early part of the tests. In general, a representative storage coefficient for the aquifer should be on the order of the average value listed on Table B-1 (0.11).

Using the average hydraulic conductivity value described above and more recent ground water flow gradient information, a more representative ground water flow velocity can be calculated. An estimate of ground water flow rate for the dominant flow condition can be derived by multiplying the measured hydraulic gradient (0.001) by the estimated hydraulic conductivity (700 feet/day as discussed above) and dividing the product by an assumed porosity for sand and gravel aquifer (30 percent). The resultant value is approximately 2 feet per day.

APPENDIX A.4

TECHNICAL MEMORANDUM #8
GROUND WATER MODELING & TREATABILITY STUDY FOR GROUND WATER

TECHNICAL MEMORANDUM NO.8

SITE: NSA, a Division of Southwire Company
LOCATION: Hawesville, Kentucky
JOB NUMBER: 22784-005-121
CLIENT: NSA

PRELIMINARY DESIGN EVALUATION
GROUND WATER EXTRACTION SYSTEM

The proposed ground water extraction system design was evaluated on a preliminary basis using ground water flow modeling to project the zones of influence likely to be achieved by the system. The proposed system consists of 12 extraction wells, nine in the northern plume and three in the southern. Each well was designed for a yield of approximately 80 gallons per minute (gpm) for a total production capacity of approximately 1,000 gpm. This capacity would be managed by selective use of wells and/or valving of production to fine tune the capture of cyanide-contaminated ground water while staying below the treatment plant capacity of 500 gpm.

The ground water flow modeling effort utilized MODFLOW, a modular, three-dimensional, finite difference ground water flow model developed by the U.S. Geological Survey (McDonald and Harbaugh, 1988). The model was constructed using a 4,000 by 6,000-foot grid of 100-foot by 100-foot block centered cells, with the Ohio River constituting the easternmost column of cells. The eastern and western columns were established as general head boundaries with head values of 367 and 365 feet msl respectively to simulate a gradient of 0.005 across the site. Simplifying assumptions of the model include that the aquifer is homogeneous and isotropic, and that the base of the aquifer is located uniformly at elevation 300 feet msl (likely base of the pumped zone).

A series of pumping scenarios were tested, one of which is illustrated on the attached figure. Under this scenario, seven wells located in the center to the two plumes are pumped near their capacity. The impact of the pumping on piezometric conditions can be seen as a deflection of piezometric contours around the wells. The projected zones of capture for the two areas of pumping suggest that operation of this scenario would effectively capture ground water having reported concentrations in excess of 0.1 mg/L of both total and amenable cyanide.

CONCLUSIONS OF THE TREATABILITY STUDY

Information within this appendix is taken from the "Ground Water Treatability Study Report (October 28, 1991)" prepared by Dames & Moore.

Due to the marginal removal efficiencies for total cyanide, and very low removal efficiencies for free cyanide, alkaline chlorination, for the evaluated, was judged not to be viable treatment technology for removing cyanide from ground water at NSA's Hawesville facility.

The process of chemical coagulation/precipitation using ferrous sulfate with lime as the coagulant provided removal efficiencies for cyanide in the range of 94-99 percent for the conditions evaluated. These removal efficiencies indicated that the chemical coagulation/ precipitation process is a viable technology for treating cyanide contaminated ground water at NSA's Hawesville facility. Applying these removal efficiencies to the expected total cyanide

influent concentration of 2.5 ml/g, it appears that the process can meet expected performance requirements for effluent standards of 1.20 mg/l for total cyanide, 0.86 mg/l amenable cyanide, and 0.022 mg/l free cyanide.

The treatability study procedures for chemical coagulation/precipitation examined different Fe/CN dose rations and operating pH's while maintaining the lime dosage at 500 mg/l. Process performance was acceptable over the entire range of Fe/CN ratios (15:1 to 35:1). For the dilute samples evaluated, removal efficiencies appeared slightly better at higher pH. As evaluated in this treatability study, the range of operating conditions that proved successful are summarized below:

- lime dosage[*] <Footnote>* It should be noted that the chemical coagulation/precipitation process utilized lime during the treatability study. However, the pump and treat apparatus information submitted by Dames & Moore on behalf of NSA does not utilize lime. This apparatus by Unocal utilizes the following chemicals: Nalclear 7763 Flocculant (acrylamide/acrylate polymer in hydrocarbon solvent), ferrous chloride or ferrous sulfate, and sodium hydroxide. Information submitted by the manufacturer indicates that the omission of lime in the process will not impact apparatus efficiency in the removal of contaminants from extracted ground waters.</footnote> of 500 mg/l

- Fe/CN dose ratio of 15:1 to 35:1

- reaction pH of 6 to 8

It is expected that acceptable cyanide removal efficiencies can be realized at Fe/CN dose ratios of less than 15:1. Based on this expectation and an evaluation of the process chemistry, it is also likely that the required lime dosage rate may be significantly reduced from the 500 mg/l fixed during the treatability study.

The sizing of the rapid mixer, flocculator, and clarifier is based predominantly on hydraulic considerations, and as such, is defined by the expected flow rate of 500 gpm. The process feed systems can be designed based on available data without significant cost impacts caused by potentially varied ferrous sulfate or lime feed rates. Based on a Fe/CN dose ratio of 15:1 and optimized lime addition, a preliminary estimate of dewatered sludge production would be on the order of 1.5 to 2 tons per day at full scale operation.

APPENDIX A.5

ANALYTICAL DATA FROM LIST REPORT
11/89-1/90

Analytical Data Summaries and Sample Location Maps
for Listing Site Inspection at National Southwire Aluminum

Samples Collected by NUS Corporation, FIT 4
November 1989 - January 1990

All samples analyzed for complete target compound list. In addition, all groundwater samples (Table 14) analyzed (SAS) for Free Cyanide.

APPENDIX A.6

SUMMARY OF MONITORING WELLS INSTALLED AT THE NSA SITE

APPENDIX B

COPY OF THE PROPOSED PLAN PRESENTED AT THE PUBLIC MEETING
AT THE HANCOCK COUNTY MIDDLE SCHOOL, JANUARY 19, 1993,
NEAR HAWESVILLE, HANCOCK COUNTY, KENTUCKY.

INTRODUCTION

The U.S. Environmental Protection Agency (EPA), in cooperation with the Commonwealth of Kentucky Natural Resources and Environmental Protection Cabinet KNREPC), has begun the Federal "Superfund" process to address environmental contamination at the National Southwire Aluminum Company Site (the "Site") near Hawesville, Hancock County, Kentucky (Figure 1). EPA is issuing this fact sheet in order to provide a notice of proposed Interim Remedial Actions for the Site, to familiarize the public with those proposed actions as part of the public participation

requirements under section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to inform the public about the initiation of the Remedial Investigation and Feasibility Study (RI/FS) at the Site.

EPA is proposing that an Interim Remedial Action be conducted at the Site to: 1) limit further ground water contamination, 2) attempt to prevent migration of contaminants, and 3) initiate ground water restoration while the RI/FS and post-RI/FS activities are being completed. Previous investigations by EPA, the Commonwealth of Kentucky, and the National Southwire Aluminum Company (NSA, Inc.) indicate that the unconsolidated alluvial aquifer beneath the Site is contaminated in two onsite locations with cyanide, metals, and fluoride. The onsite locations identified thus far that contain significant ground water contamination are: 1) the spent potliner disposal area (North Plume); and 2) the previous location of the dump pad (South Plume) (Figure 2).

This Interim Remedial Action is proposed to remove some of the contaminants from the ground water aquifer, provide short-term contaminant control, and gain additional information about the alluvial aquifer's response to clean up. It is an interim measure and is not considered the Final Remedy for the Site. During the RI/FS the best long-term solutions for the Site will be identified. Upon conclusion of the RI/FS, EPA will present several of the best potential remedies for the Site to the public for comment.

This fact sheet provides background information on the Site, describes the Interim Remedial Action, provides the rationale for EPA's identification of the Preferred Alternative, and outlines the role of the public in helping EPA make a final decision on a remedy.

SITE BACKGROUND

The NSA Site consists of approximately 1,100 acres adjacent to the Ohio River approximately 4 miles northwest of Hawesville, Kentucky. This Site is situated within the broad alluvial floodplain of the Ohio River of northwestern Kentucky, approximately 30 miles east of Owensboro. Much of the Site lies within the 100-year floodplain of the Ohio River. The Site has been utilized from 1969 to the present, and is still an

EPA encourages the public to review the Administrative Record located at the Hancock County Public Library and to submit written comments on the Interim Remedial Action alternatives presented in this plan. Public comments may influence aspects of EPA's proposed Interim Remedial Action.

active facility that engages in aluminum smelting operations. NSA owns and operates the facility and appears to be the only Potentially Responsible Party (PRP). Site features include a number of manufacturing and service buildings, three former waste disposal impoundments, an active wastewater impoundment, three former waste disposal landfills, a potliner accumulation building, and a drainage ditch, and a refractory brick disposal area. In the central-western portion of the site is the Hancock County Airport. At the southeastern portion of the site is the Southwire Rod and Cable Mill (a division of the Southwire Company of Carrollton, Georgia). Adjacent to the site (northwest) is the Big Rivers Power Plant.

SITE OPERATIONS

The facility produces elemental aluminum from aluminum ore. The ore is delivered to the site by barge (via the Ohio River) and transferred to the production areas by a conveyer system. Elemental aluminum is produced by placing the alumina ore (Al[2]O[3]) in carbon-lined metal vessels called pots. In order to facilitate the process, a sodium fluoride bath (Na[3]AlF[6]) is added to the pots. Direct current (DC) is run through the pots, reducing the aluminum in the ore to its elemental state. Molten aluminum collects in the bottom of the pots where it is siphoned off. The molten aluminum is then transported in crucibles to adjoining buildings, where it is cast into ingots. Molten aluminum is also supplied to Southwire Rod and Cable, adjacent to the south of the plant.

Where the carbon-lined pots are exposed to air during this process, cyanide is produced and incorporated into the pot liner. The facility has 448 active carbon-lined pots. The aluminum-reducing pots are operated continuously until the carbon liner begins to burn through. This process takes approximately 5-10 years to occur. Once a pot begins to experience burn-through, it is taken out of service and replaced with a reconditioned pot. The decommissioned pot is prepared for use again by removing and replacing the carbon liner (potliner). In 1971, potliner removal began at the facility. In 1973, a concrete pad called the dump pad was constructed specifically for the removal of potliners. The concrete pad was upgraded to an enclosed containment structure in 1991. This building is now referred to as the Spent Potliner Accumulation Building. Prior to 7/25/86, the potliners were disposed of onsite in the potliner disposal area. According to NSA, approximately 26,000 cubic yards of spent potliners were disposed in the North Pond. After this time, the potliners were shipped offsite to an EPA approved disposal facility.

Two clay-lined ponds (North and Old South Ponds), one unlined pond (East Pond), and one synthetically-lined pond (New South Pond), each covering approximately six acres, were constructed for disposal of industrial wastes from the facility. Wastes disposed of in the North Pond included spent pot linings containing cyanide from the aluminum reduction process and calcium fluoride slurry from the air quality control system. Calcium fluoride slurry was disposed of in the Old South Pond, East Pond, and New South Pond. NSA closed the North Pond in 1986 and covered it with a synthetic cap and a layer of soil. The area is now covered with low vegetation and grass. The Old South Pond has been filled to capacity, and its use ceased in 1989. The East Pond has also been closed. The New South Pond is now used for disposal of the calcium fluoride slurry and electrostatic precipitator catch, as approved by the State of Kentucky Division of Waste Management.

ENVIRONMENTAL SAMPLING

In 1980, a contractor hired by NSA (Environmental Resource Management, Inc.) to investigate the ground water determined that leaching of cyanide and fluoride was occurring beneath the North Pond. A Preliminary Assessment was completed by the Kentucky Division of Waste Management on February 25, 1986. In the late 1980's, the Commonwealth of Kentucky referred the Site to EPA for ranking under the Hazard Ranking System (HRS). In 1990 and 1991, samples from surface

soils, subsurface soils, sediments, surface waters, monitoring wells, industrial wells, and some private well samples were collected during the EPA Preliminary Field Investigation as reported in the Interim Final Listing Site Inspection Report by NUS Corporation (April 1991).

All documents related to previous ground water investigations are in the administrative record and available for review. NSA, through its consultants, has also collected additional data regarding the environmental condition of the property. NSA has stated to EPA that it has cleaned out a drainage/effluent ditch that was found to contain significant concentrations of fluoride and metals.

During onsite construction of a cooling tower foundation in 1991, NSA identified significant levels of PCBs. In order to finish construction activities at this location, NSA removed and disposed of approximately 850 cubic yards of PCB-contaminated soils at the excavation for a cooling tower footing. Present information suggests that PCB contamination exists near the foundation of the cooling tower and the adjacent areas. These areas will be further investigated during 1993 to determine the full extent of contamination.

The NSA Site was proposed for inclusion on the National Priorities List (NPL), as defined in Section 105 of CERCLA, as amended, 42 U.S.C. 9605, in July 29, 1991. At present, this Site has not been listed as final on the NPL.

RI/FS TO BE CONDUCTED UNDER AGREEMENT WITH EPA

A Superfund Remedial Investigation and Feasibility Study or RI/FS will be conducted at the Site to determine the nature and extent of contamination and provide an evaluation of appropriate alternatives for permanent Site cleanup. The Site RI/FS and associated environmental studies will be conducted under the Administrative Order on Consent that NSA, Inc. signed with EPA on September 30, 1992. EPA and the Commonwealth of Kentucky will oversee all RI/FS and related studies performed by NSA to ensure compliance with all applicable laws and regulations and to ensure that the work proceeds in a timely manner.

The RI will identify all areas of Site contamination and where these contaminants might have migrated. The information gathered during the RI will then be used to develop a Feasibility Study (FS) which will evaluate options for cleaning up the Site. The FS is expected to be completed by December 1993. Site field work will begin in March of 1992. The field work includes: 1) installation of additional ground water monitoring wells in areas suspected to be contaminated, 2) soils and sediment sampling on and offsite in areas suspected to be contaminated, 3) sampling of all onsite wells and offsite residential wells, and 4) any other activities identified during the ongoing review of the RI/FS Work Plan that would allow EPA, the Commonwealth of Kentucky, and NSA to better understand and cleanup the Site.

THE NEXT STEP: ONCE THE RI/FS IS COMPLETED

At the completion of the FS, EPA will develop another Proposed Plan which will describe several alternatives under consideration, as well as EPA's preferred alternative for the Final Remedy for the Site. A copy of the proposed plan, which will include a brief description of the RI/FS results, will be mailed to interested parties and all persons who have requested to be included on EPA's mailing list for the Site. EPA will conduct a 30-day public comment period on the RI/FS Report and the Proposed Plan to provide an opportunity for public involvement in the final cleanup decision.

EPA will also conduct a public meeting at that time to discuss the RI/FS and the proposed plan, and to address community questions and concerns. After the public meeting and public comment period, EPA will review and consider all comments received from the community as part of the

process of reaching a final decision on the most appropriate remedial alternative, or combination of alternatives, to address contamination found at the NSA Site. EPA's final choice of a remedy will be documented in the Record of Decision (ROD), which will include a report called a Responsiveness Summary. A Responsiveness Summary is designed to summarize citizen and other questions/comments and provide EPA responses.

After the ROD is signed by the EPA Regional Administrator, EPA will negotiate with the PRPs to design and implement the final cleanup plan. At the end of the negotiation period, EPA and the Commonwealth of Kentucky will oversee the development of engineering design plans for implementation of the selected remedial alternative.

SCOPE AND ROLE OF PROPOSED INTERIM REMEDIAL ACTION

Due to the length of time required to complete the RI/FS (typically 18 to 24 months) and the possibility of further plume migration, EPA feels that it is appropriate to initiate an Interim Remedial Action on Site ground water. The proposed Interim Remedial Action (which will be described in the Interim Remedial Action ROD) would begin ground water cleanup while RI/FS and post RI/FS activities are being completed. This proposed Interim Action would initiate a reduction of risks to human health and the environment posed by the cyanide, metals, and fluoride in onsite ground water plumes (North and South Plumes). Previous onsite investigative work, including 36 previously installed wells and 15 recently installed wells, provides the required information to support interim activities, and will significantly reduce the time needed for this final investigation.

This Interim Action does not constitute the Final Remedy for the Site. A Final Remedial Action will be developed to fully address the principle threats posed by Site conditions following the conclusion of the RI/FS. Upon completion of the RI/FS, the ground water treatment system embodied by this Interim Action may be incorporated into the Site remedy design specified in the final action ROD. This Interim Remedial Action would be monitored carefully to ensure that hydraulic control and remediation of the contaminant plume can be achieved and to determine the feasibility of incorporating interim measures into the Final Remedy for the Site.

Once the RI/FS is completed, work will begin on the Remedial Design/Remedial Action for the Final Action. Again, since much of the "interim" measure work will likely aid in the Final Action, the RD/RA for the Final Remedy will likely take between 8 and 12 months to complete. This is a significantly shorter period of time than usual.

SUMMARY OF SITE RISKS

Cyanide, metals, fluoride, and PCBs are contaminants of concern at the NSA Site and have been or are being released from the Site in other than a controlled manner. Metals include but may not be limited to: lead,manganese, nickel, beryllium, cadmium, arsenic, chromium, and barium. Some of these contaminants found at the Site are very toxic at extremely low levels, and they also tend to bioaccumulate. These contaminants, other than PCBs, are readily soluble and have leached or migrated from soils into the groundwater. Cyanide at the Site has been reported at levels ranging from traces up to 56 parts per million (ppm) in the ground water (The highest level EPA allows in ground water or the Maximum Contaminant Level (MCL) for cyanide is 0.2 ppm). Levels in North Pond surface waters prior to covering were 165 ppm.

Fluoride is a by-product of the ionization of cryolite, and is concentrated as a waste product by the air emissions filtration system at the Site. In the environment, fluorides are soluble and can result in a variety of toxicological effects, including fluorosis, a syndrome resulting from chronic exposure and characterized by bone and tooth damage. Fluoride was found in the ground water adjacent to the North Pond area at levels up to 1,700 ppm (The MCL for fluoride is

4.0 ppm). PCBs are oil-based contaminants that are not readily soluble, can be carcinogenic and tend to bioconcentrate. PCB's were identified during construction activities for the cooling tower foundation. Levels of PCB's in onsite soils ranged from less than 1 ppm up to 8,940 ppm. EPA cleanup levels in soils will be determined during the RI/FS. These levels are commonly 1 to 10 ppm. PCBs do not easily leach into ground water, however, they were identified in leachate at one of the onsite landfills at levels up to 7.3 ppb. The EPA allowable limit for PCBs in ground water is 0.5 ppb.

Much of the Site contamination is due to the breaking up of spent pot liners on the dump pad and also by disposal of wastes into surface impoundments. Pot lining material, a by-product of the aluminum reduction process which may contain cyanide, has been disposed of in the North Pond which was closed in 1986, and in two other smaller onsite disposal areas immediately north of the main industrial complex. Prior to impoundment or landfill covering, this material was transportable by wind, water, and human activities. Cyanide and other metals have leached into the groundwater at the surface impoundments, spent potliner accumulation building, and the smaller landfills. Calcium fluoride is present at the Site in most media. It is presently believed that groundwater flows generally from the Site to the Ohio River, less than 3/4 mile away. On-Site water production wells south of the impoundments may create a cone of depression that may influence groundwater movement at the Site. At the present time, risks appear to be low concerning the Ohio River. Present monitoring well information suggests that any contaminants that do enter the river are diluted to the point where they are not detectable. This will be further evaluated during the RI/FS to be certain risks remain low for the Ohio River.

The manufacturing facility is externally fenced; however, the surface impoundments are not isolated by fencing from other portions of the Site such as the adjacent airfield. There are no barriers to human or wildlife movement between the surface impoundments and this public airfield.

DESCRIPTION OF REMEDIAL ALTERNATIVES

The alternatives that EPA has evaluated for the Interim Action are described briefly below. EPA evaluated these options using the nine evaluation criteria listed in Table 1.

Alternative 1: No Action

Cost: $0

Time to Implement: N/A

The EPA requires that this alternative be evaluated at every site to serve as a baseline for comparison for all other alternatives considered. Under this alternative, no groundwater remediation would take place. The only reduction of contaminant levels that could potentially occur would be via natural processes such as dispersion or attenuation. There would be no associated costs with this alternative.

Alternative 2: Pump and Treat System

Construction cost	$ 1.7 million
Annual operation and maintenance costs	$ 570,000
Time to implement	6 months

This alternative would ensure that active treatment of the two onsite ground water plumes would begin during the RI/FS. Ground water containing cyanide, metals, and fluoride would be collected (pumped) from extraction wells placed in the North Plume and South Plume. The exact number of wells utilized for extracting contaminated ground waters will be determined as part of the Remedial Design (RD) for the Interim Action. The RD will take place after Consent Decree (CD) negotiations are completed for the interim action ROD.

The extraction well pump and treat system would effectively

limit the onsite spread of contaminated ground water in the unconsolidated aquifer, and potentially limit any spread of contaminated waters offsite. The volume and amount of hazardous contaminants within the aquifer would also be reduced. This action would achieve significant risk reduction early in the Superfund process. The treated waters would be discharged into the Ohio River. The system would be operated in compliance with the Kentucky Pollutant Discharge Elimination System (KPDES) Ohio River discharge limits, and with regulations that govern ground water withdrawal from the Ohio River Valley alluvial aquifer.

In order to assess the performance of the ground water extraction pump and treat system, evaluation of alluvial aquifer conditions will be an ongoing effort during the RI/FS. Additional information obtained by this Interim Remedial Action will assist in determining the most appropriate cleanup measures for the Final Site Remedy.

EVALUATION OF ALTERNATIVES

The proposed Interim Remedial Action for the Site is presented as Alternative 2 and involves ground water collection and pump and treatment for cyanide, metals, and fluoride contaminated ground waters using a ferrous precipitation and settling process. These activities will be performed while the Site RI/FS is being conducted.

This section provides the basis for determining which alternative: 1) meets the threshold for overall protection of human health and the environment and compliance with applicable and relevant and appropriate requirements (ARARs), 2) provides the "best balance" between effectiveness and reduction of toxicity, mobility, or volume through treatment, implementability, and cost, and 3) demonstrates state and community acceptance.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The only alternative that would sufficiently be protective of human health and the environment would be Alternative 2. The "No Action" Alternative is not protective because it does not address the most significant threats to human health and the environment at the NSA Site. Therefore, the "No Action" Alternative will not be considered further in this analysis as an option for the Site. Alternative 2 is protective of human health and the environment since it reduces or controls significant and immediate threats from two onsite ground water plumes containing significant levels of cyanide, metals, and fluoride. The pump and treat system would also limit the potential spread of contamination onsite.

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Alternative 2 would meet all State and Federal ARARs concerning the implementation of the ground water collection and pump and treat system. The ground water treatment plant would meet all ARARs for discharge to surface water. All activities concerning handling and disposal of the sludge generated from the operation will be in compliance with State and Federal ARARs. Waste sludge (2.5 tons per day) would be disposed of at an EPA approved disposal facility. Treated water will be released into the Ohio River and all treated water will be in compliance with

KPDES requirements for contaminants identified.

The final cleanup levels for the ground water are not addressed in this "interim" remedy because such goals are beyond the limited scope of this action. The final cleanup levels will be addressed by the final remedial action ROD for the Site. However, it is expected that continued implementation of the pump and treat system would reduce levels of cyanide to the MCL of 0.2 ppm.

LONG-TERM EFFECTIVENESS AND PERMANENCE

Interim measures (Alternative 2) as described in this document would not provide any degree of long-term effectiveness concerning remediation of source waste at the NSA Site. However, the pump and treat system would permanently eliminate contaminants from collection well waters prior to discharging the treated waters in the Ohio River. The Interim Action is intended to address the most imminent and substantial problems at the Site. This would occur while the RI/FS and Post RI/FS activities are being completed. Alternative 2 is consistent with the Agency's long-term goal of restoration of Site and adjacent area ground water. In addition, the two on-site cyanide plumes would be hydraulically controlled to reduce the possibility of offsite migration. This would offer significant advantages during implementation of the Final Remedy for the Site.

Additional data would be generated during implementation of the Interim Remedial Action. This information concerning hydraulic conductivity and aquifer response would be used in conjunction with RI/FS data to facilitate Final Remedy selection. Long-term effectiveness and permanence will be more thoroughly evaluated at that time.

REDUCTION OF TOXICITY, MOBILITY, AND VOLUME

Alternative 2 would effectively reduce toxicity and mobility of contaminants (specifically cyanide) in the ground water plumes at: 1) the waste water impoundment areas, and 2) under and near the spent potliner accumulation building (formerly the dump pad). Contaminants withdrawn from the extraction wells would be permanently eliminated. It is expected that contaminant levels within the two onsite ground water plumes would be significantly reduced through implementation of the ground water extraction pump and treat system. Continued implementation of the system may potentially reduce the volume of contaminated waters in the alluvial aquifer. During the RI/FS, the onsite source will be thoroughly evaluated and appropriate action will be taken as part of the Final Remedy to insure continued ground water contamination does not occur.

SHORT-TERM EFFECTIVENESS

Significant short-term effectiveness would result from implementation of Alternative 2. The "interim" action is effective in the short-term because it would significantly reduce the potential threats from contaminants in the two onsite ground water plumes. However, short-term risks would be slightly elevated during transfer of sludge from the sludge holding tank, sludge transfer area, solids collection area, and the filter press area to transport and then disposal facilities. These 4 system areas would be routinely maintained during the Interim Action and associated risks would thus be minimal.

IMPLEMENTABILITY

The implementability of Alternative 2 is based on technical feasibility, administrative feasibility, and availability of services and materials. Alternative 2 is readily implementable since the standard design and construction methods are utilized. Also, there are no expected difficulties concerning administrative feasibility or availability of services or materials for

the implementation of Alternative 2.

COST

Alternative 2 has a present worth cost of $1.7 million. The annual operation and maintenance cost will be $570,000. Additional areas of contamination that are not addressed during this Interim Action will be evaluated during the RI/FS. The associated cleanup costs for these areas will be evaluated after additional information is obtained.

STATE ACCEPTANCE

EPA is currently seeking State concurrence with this Proposed Interim Remedial Action.

COMMUNITY ACCEPTANCE

Community acceptance of the Interim Remedial Action will be evaluated after the public comment period and will be described in the Record of Decision for the Site.

The public is asked to comment on the proposed Interim Remedial Action during the Public Comment Period, which is from January 7, 1993 through February 7, 1993.

SUMMARY OF STATUTORY FINDINGS

The Preferred Alternative represents the best balance among the criteria used to evaluate remedies and would achieve significant risk reduction through treatment of the ground water in the alluvial (unconsolidated) aquifer. Based on the information available at this time, EPA believes that the Interim Action would be protective of human health and the environment, would comply with ARARs, and would utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable.

EPA'S PREFERRED ALTERNATIVE

The preferred Alternative (Alternative 2) involves the use of ground water collection and pump and treat system. This system utilizes a precipitation and settling process that will reduce cyanide, metals, and fluoride in the treated ground water to acceptable levels. Treated ground water exiting the system will be discharged to the Ohio River under applicable KPDES requirements. State requirements for ground water withdrawal will not be exceeded.

The effectiveness of the collection well pump and treat system in reducingthe previously mentioned contaminants, and controlling the two ground water plumes will be evaluated through an extensive monitoring program as part of the RI/FS. The proposed monitoring program will include all existing (usable) monitoring wells onsite, and all residential wells in adjacent offsite areas that are determined as part of the RI, to be potentially affected by Site conditions.

The Preferred Alternative would allow EPA to initiate cleanup of the contaminated ground water aquifer while the RI/FS and related activities are being completed, and to expedite the Superfund Process. Further migration of contaminants in the ground water will be reduced.

TECHNICAL ASSISTANCE GRANTS

EPA has been authorized by Congress to provide communities affected by Superfund Sites the opportunity to apply for Technical Assistance Grants (TAGS). Grants range up to $50,000 per site and are designed to enable community groups to hire technical advisors or consultants to help them interpret EPA findings and specifications for cleanup activities. The community must

provide a 20% match to the amount provided by EPA and only one TAG is awarded per site. Interested persons or community groups may contact the Region IV Grants Specialist listed below.

Sharon Chandler
Technical Assistance Grant Specialist
U.S. EPA, Region IV
345 Courtland Street., N.E.
Atlanta, GA 30365
(404) 347-2234

THE NEXT STEP: THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

EPA solicits input from the community on the cleanup methods proposed for each superfund response action. EPA has set a public comment period from January 7, 1993 to February 7, 1993, to encourage public participation in the selection process. The comment period includes a public meeting at which the EPA will present the Proposed Plan and announce the startup of the Site RI/FS, answer questions, and receive both written and oral comments. The public meeting is scheduled for 7:00 PM, January 19, 1993 and will be held at the Hancock County Middle School, near Hawesville, Kentucky. Comments will be summarized and responses provided in the Responsiveness Summary section of the Interim Remedial Action ROD, which is the document that presents EPA's interim selection for initiation of site cleanup. The public can send written comments to or obtain further information from:

Douglas A. Bell
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365
(404) 347-7791
1-800-435-9233

The Proposed Plan, Supplemental Information for the Interim Action, Current Site Conditions Report, and other pertinent Site related documents have been placed in the information repository and the Administrative Record for the Site. The Administrative Record includes all documents that were used in developing the alternatives for the NSA Site. These documents are available for public review and copying at the following location:

Hancock County Public Library
Court Street
P.O. Box 249
Hawesville, KY 42348
(502) 927-6760
Contact: Jackie Walter
Copy Facilities Available: 10 cents.

MORE INFORMATION

The public can send written comments to or obtain further information from:

Douglas A. Bell
Remedial Project Manager
U.S. EPA, Region IV
354 Courtland St., N.E.
Atlanta, GA 30365

(404) 347-7791
1-800-435-9233

Suzanne Durham
Community Relations Coordinator
U.S. EPA Region IV
345 Courtland Street, N.E.
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Eric Liebenauer
Site Manager
Division of Waste Management/Commonwealth of Kentucky
Natural Resources and Env. Protection Cabinet
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601
(502) 564-6716

NOTE: PLEASE SHARE THIS INFORMATION WITH OTHERS WHO MIGHT BE INTERESTED IN THE NATIONAL SOUTHWIRE SITE.

GLOSSARY

Administrative Order on Consent: A legal document that identifies tasks or legal requirements for the Responsible Parties to conduct the Remedial Investigation and Feasibility Study.

Administrative Record: A file which is maintained and contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is required to be available for public review and a copy is to be established at or near the site, usually at an information repository. A duplicate file is maintained in a central location, such as a regional EPA and/or state office.

Applicable or Relevant and Appropriate Requirements (ARARs): Refers to the Federal and State requirements that a remedy selected by EPA must attain. These requirements may vary from site to site.

Arsenic: A toxic metallic substance that is a by-product of the smelting process.

Attenuation: Contaminant levels may become lower over very long periods of time due to natural decomposition or chemical break down. For most hazardous waste sites, this is not viable because significant risks associated with contaminants may last for several lifetimes.

Barium: A toxic silver-white metallic substance often found in raw ores utilized in the smelting industry.

Beryllium: A toxic metallic substance generally associated with raw ores utilized in the smelting or metals machining industry. Beryllium may also be generated through the combustion of coal or fuel oil.

Bioaccumulate: The escalating accumulation of toxic materials that occurs within the food chain of an ecosystem.

Broad Alluvial Flood Plain: The nearly flat portion of the Ohio River Valley that is located on soft sediments that are deposited from repeated flooding and migration of the Ohio River and its tributaries.

Cadmium: A Toxic bluish-white metallic substance that is often a by-product of the smelting industry. Combustion of fossil fuels may also result in the release of cadmium to the environment.

Carcinogenic: Any substance that produces cancer.

Chromium: In its raw state, chromium is a toxic steel-gray metallic substance found in raw ores commonly utilized in the smelting industry. Another common source of chromium is through the combustion of fossil fuels.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either pay for site cleanup when the responsible parties cannot be located or are unwilling or unable to perform the work, or take legal action to force responsible parties to clean up the site or reimburse EPA the cost of the cleanup.

Cone of Depression: Withdrawal of ground waters from a well usually influences the ground water

adjacent to the well. This influence if shown on a map may be circular (similar to a cone) and generally represents a lower level of ground water for a variable distance from the well.

Consent Decree: A legal document that outlines the actions the Responsible Parties will undertake for the Remedial Design and Remedial Action at a Superfund Site.

Cyanide: The toxic, colorless solid or substance is incorporated into carbon potlining material during the aluminum smelting process at the NSA Site.

Dispersion: As contaminants move away from their source they tend to be less concentrated since they mix with more and more ground waters.

Ferrous Precipitation: A process allows ferrous iron in ground water to combine with cyanide and settle out of the water. This allows the cyanide to be collected and separated into sludge that can be disposed of at an EPA approved disposal facility.

Fluoride: Is a pale-yellow to green substance that at the NSA Site is a by-product of the aluminum smelting process. In low concentrations fluoride is not hazardous. However, at elevated levels fluoride may have adverse affects (see fluorosis).

Fluorosis: A syndrome sometimes seen following chronic exposure to fluoride in which subjects exhibit symptoms such as mottled tooth enamel and bones that are harder and more brittle.

Ground water: Underground water that fills pores in soils or openings in rocks to the point of saturation. Unlike surface water, groundwater cannot clean itself by exposure to sun or rapid aeration. Groundwater is often used as a source of drinking water via municipal or domestic wells.

Information Repository: A file containing current information, technical reports and reference documents regarding a Superfund NPL site. The information repository is usually located in a public building that is convenient for local residents, such as a public school, city hall, or a library. As the site proceeds through the Superfund Remedial Process, the file at the information repository is continually updated.

Interim Remedial Actions: Usually short-term cleanup activities selected to reduce risks at a Superfund site while investigations continue. Once additional information is obtained from studies and also from the Interim Remedial Action, then the Final Remedy is proposed for the Site.

Interim Action Record of Decision: A public document that presents information concerning an expedited cleanup alternative that has been selected to reduce or eliminate problems at a National Priorities List site prior to implementation of the Final Remedy. This document also explains the reasons for choosing that cleanup alternative over other possibilities.

Kentucky Pollutant Discharge Elimination System: See National Pollutant Discharge Elimination System.

Lead: A toxic bluish-gray metal that at the NSA facility is a byproduct of aluminum manufacturing processes. Lead is also commonly found in paint, solder, and pipes.

Manganese: A toxic metallic substance that is commonly combined with other chemicals to form manganese compounds. These compounds are commonly found in ores utilized in the smelting industry.

Maximum Contaminant Levels: The maximum allowable level a contaminant may be identified at before EPA can take action.

Metals: Inorganic substances including but not limited to: arsenic, barium, beryllium, cadmium, chromium, lead, manganese, and nickel.

Monitoring Program: The continued collection of information about the environment that helps gauge the effectiveness of a cleanup action.

National Pollutant Discharge Elimination System (NPDES): A provision of the Clean Water Act which prohibits the discharge of pollutants into waters of the United States unless a special permit is issued by EPA [State (where delegated), or a tribal government on an Indian reservation] allowing a controlled discharge of liquid after it has undergone treatment.

National Priority List: A list of the nation's hazardous waste sites that are eligible for cleanup under Superfund (1980) and SARA (1986).

Nickel: A toxic silver-colored metal commonly found in ores used in the smelting industry.

PCBs (Polychlorinated biphenyls): These toxic compounds have been widely used in transformers and electrical equipment as coolants or lubricants.

Plume Migration: Contaminants in the ground water will usually move and spread away from the source. The affected ground waters from the source (origin) to the farthest extent of measurable contamination is called a plume.

Potential Responsible Parties (PRPs): This may be an individual, a company or a group of companies who may have contributed to the hazardous conditions at a site. These parties may be held liable for costs of the remedial activities by the EPA through CERCLA laws.

Precipitation Process: At the treatment apparatus (see pump and treat), chemicals are added to the extracted ground waters (ferrous chloride or ferrous sulfate) to cause the ferricyanide contaminant to be effectively separated from the water.

Preferred Alternative: After evaluating and examining the various remedial alternatives, EPA selects the best alternative based on relevant cost and non-cost factors. This alternative was selected from a list of the most technologically feasible alternatives for a remedial strategy.

Pump and Treat: Ground water will be pumped from the aquifer and transported via an onsite pipeline to the treatment apparatus. At the treatment apparatus the contaminants will be removed from the ground water, then the treated water will be discharged to the Ohio River. All treated water disposed of in the Ohio River will be in accordance with all State and Federal Regulations.

Record of Decision: A public document written by EPA that presents information concerning the Final Remedy selected to reduce or eliminate problems at a National Priorities List site. This document also explains the reasons for choosing that cleanup alternative over other possibilities.

Remedial Action: The EPA selected action for an NPL site.

Remedial Design: A set of specifications, plans, and procedures that describe how the remedial action will proceed.

Remedial Investigation and Feasibility Study (RI/FS): Two distinct but related studies, normally conducted together, intended to define the nature and extent of contamination at a site (RI) and to evaluate appropriate, site specific remedies necessary to achieve final cleanup at the site (FS).

Responsiveness Summary: A report that summarizes citizen comments or questions and EPA responses during the public comment period.

Settling Process: A stage of activity during the pump and treat process where contaminants are allowed to separate from the solution so they may be collected and removed from the water.

Superfund Amendments and Reauthorization Act (SARA): Modifications to CERCLA Enacted on October 17, 1986.

Unconsolidated Alluvial Aquifer: Soft sediments that reside below the Ohio River flood plain. These sediments are saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Work Plan: A report that describes activities to be performed in an upcoming investigation.

EPA MAILING LIST ADDITIONS

If you know of others that wish to be placed on the mailing list to receive information on the NSA Site, please request that they fill out and mail this form to:

APPENDIX C

INFORMATION REPOSITORY LOCATION

Hancock County Public Library
Court Street
P.O. Box 249
Hawesville, KY 42348
(502) 927-6760
Contact: Jackie Walters
Copy Facilities Available: 10 cents

APPENDIX D

LETTERS OF CONCURRENCE

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
February 2, 1993

Doug Bell
Remedial Project Manager
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Mr. Bell

This letter is written to give the Kentucky Division of Waste Management's (KDWM's) official approval of the Interim Action R.O.D. at the National Southwire Aluminum site in Hancock County, Kentucky.

KDWM concurs with EPA that this action is a positive effort to address contaminant migration, and should be implemented as soon as possible. Also, EPA's willingness to incorporate KDWM's comments into this deliverable is noted and appreciated. This willingness to acknowledge the State's concerns will undoubtedly be the cornerstone of a good working relationship on this project.

If you have any questions or concerns, please call me or Eric Liebenauer at (502) 564-6716.

Sincerely,

Caroline P. Haight, Director
Division of Waste Management

CPH/EL/kb